APPENDICES

7462 (2)

APPENDIX A

LETTERS DATED JULY 31, 1997 AND AUGUST 12, 1997

OxyChem_®

Responsible Cares

31 July 1997

Ms. Donna McCartney (3HW90) US EPA Region III 841 Chestnut Building Philadelphia, PA 19107

Date.	Dole in City
Fax to:	
FedEx:	
□ cc.	7462

RE:

OxyChem's Proposed Corrective Action Approach
Delaware City Plant RCRA Corrective Action Program

Dear Ms. McCarmey:

In recent correspondence between EPA and OxyChem, both parties have expressed concern for the direction of the RFI project at Delaware City. OxyChem too would like to move the project along and we are ready to implement the Phase II RFI with EPA approval. In response to Bob Greaves' call to OxyChem regarding the project, OxyChem has prepared this letter to introduce EPA to OxyChem's proposed project approach which we feel will help bring about resolution of the current concerns.

Our approach looks ahead to the Corrective Action component of the project as a means to evaluate the application of the existing Phase I and proposed Phase II data in selecting potential remedies. OxyChem's preferred corrective action is to contain each SWMU on site with downgradient ground water control as necessary. OxyChem believes it has or will have following Phase II, sufficient data to support this approach. A site conceptual model and a regional ground water flow model were also prepared to help in the development of this approach. With a remedy(s) in mind, the need for a baseline risk assessment as a decision making tool is no longer needed. Risk assessment will be conducted however, for offsite ecological and recreational scenarios. Although this approach may not be typical, there has been at least one precedent in Region III of a project going from study to Corrective Action without a baseline risk assessment.

In order to make the most of our 9 AM to 12 PM timeslot, we would like to focus the meeting on the three larger project issues which were identified in our 20 June letter. The issues are: additional source delineation, intraformational hydrogeology and risk assessment. Discussion and resolution of the three project issues will enable OxyChem to address the individual comments raised in EPA's 5 June Phase II RFI work plan comment letter. If additional clarification is needed after the meeting, the appropriate technical people from both parties can conference via telephone.



2

Potential Onsite Corrective Action

OxyChem's preferred approach to Corrective Action at Waste Lake 1, Waste Lake 3, and the Old Brine Sludge Landfill is to provide on-site, inplace containment. One method would be capping to eliminate infiltration, volatilization and direct contact. The waste materials are not in contact with ground water except perhaps on a seasonal basis at Waste Lake 1. Following containment, groundwater control would be provided downgradient of Waste Lake 1 to manage the ground water migration pathway. This SWMU however is the most downgradient of all the SWMUs mentioned above and which are all situated atop the subsurface paleochannel. This geologic feature functions as a preferred ground water flow pathway. Consequently, any ground water control for Waste Lake 1 will also manage any historical releases from the upgradient SWMUs.

Since many of the SWMUs were operated as a monofill-like (or essentially so) waste management unit, OxyChem believes that the limited Phase I waste boring analytical data is sufficient to represent the chemical quality of the entire SWMU. Thus data along with downgradient ground water quality data exceed conservative RBC screening criteria indicating that Corrective Action is warranted. Further sampling to delineate concentration gradients within these units (where the waste was deposited in a random manner and frequency) would only confirm what is already known from the Phase I data screening. Additionally, the limits and depths of these SWMUs are readily discernible from the surface and from design plans. Thus the areal extent and volume of waste materials can be calculated with reasonable certainty. Their relatively small size (2 to 4 acres) and their relatively homogeneous composition lend themselves to potential Corrective Action technologies that apply to the entire unit rather than to a portion of them. Accordingly, no additional source area delineation for these SWMUs is warranted or proposed.

With significant macro-scale hydraulic control of the ground water system provided by the subsurface paleochannel, the need for hydrogeologic investigation of seasonal perched water or individual sand lense flow pathways is not warranted. Additional ground water characterization is warranted however for the deeper Potomac Aquifer and will be conducted in Phase II. Initial data from previous studies on and adjacent to the site suggest that there is no vertical connection between the shallow-and-deep-flow-systems.

Phase II will however incorporate several source area identification and delineation tasks to fill data gaps. These tasks are proposed for the Sand Blast Grit Area and the Standard Chlorine Pipeline. The occurrence of any potential source areas within the active plant production area will be accomplished via downgradient ground water investigation and, if needed subsequent downgradient ground water control. The production area contains SWMUs of Concern such as the Waste Water Treatment Plant and the Former CCL4 Tank Area as well as other SWMUs previously characterized as

SWMUs of Minimal or No Concern. This more comprehensive downgradient approach to characterizing an active production area which, by its active nature presents limitations to implementation of remedial activities, has been previous accepted by EPA with the understanding that direct source area study may be warranted depending upon the ground water quality.

EPA's comments have also helped to identify the need for source area characterization in the 48-acre Waste Lake 3 in the vicinity of waste boring 6. Phase I waste concentrations exceed RBCs and Corrective Action is warranted, however the limits of the affected area are undefined. Phase II will incorporate a source area delineation task. Because of this unit's location away from potential Corrective Action activities at the plant and/or paleochannel SWMUs, the waste boring 6 area and the Chemfix Test area will likely require implace containment, localized ground water control or consolidation within the other SWMUs as part of Corrective Action.

Risk Assessment

By looking ahead to Corrective Action and applying the existing Phase I data RBC screening which already calls for Corrective Action, likely remedial options have been identified. These options serve to manage the risk by eliminating the constituent migration pathways at each SWMU. As such, with a remedy(s) in mind, the need for a base line risk assessment becomes much less critical since it is not needed as a decision making tool to evaluate potential Corrective Action. This approach is consistent with the draft 1990 Proposed Corrective Action Rule which endorses risk screening as a tool for evaluating Corrective Action.

Pat2

Risk assessment will be utilized however to assess risk to ecological and recreational receptors in Red Lion Creek. The results of our regional ground water modeling show that Red Lion Creek serves as a ground water discharge boundary. This is not unexpected given the site's location adjacent to the 1500 foot wide Red Lion Creek marsh and the Delaware River, two regional ground water sinks. The model will be presented at our meeting.

Shallow ground water discharge from the site to the creek will likely undergo some constituent mass removal as it flows through adsorptive organic sediments and peat in the marsh (see attached site conceptual models). The effectiveness of the marsh sediments for removing mass will be evaluated by comparing shallow ground water quality data collected from proposed Phase II creek piezometers with similar data collected onsite along the same ground water flow path. Depending upon the sediment's capacity to attenuate constituents, the discharging ground water may or may not present an unacceptable risk. However, the accumulation of constituents in the sediments from the ground water flow and surface water runoff may also present some risk. OxyChem's location both downstream of two CERCLA sources area and downgradient of a portion of the Star landfarm and landfill will also contribute to constituents in the sediments.

4

Future constituent contributions to the marsh following Corrective Action will be eliminated by such options as SWMU containment, surface water runoff controls and ground water control onsite. The remaining constituent mass in the ground water system will experience some attenuation as it flows through the organic sediments. The risks to the various receptors from both sediments and surface water will be calculated in Phase III following applicable guidance. Should the risk assessment determine that unacceptable risk is posed by the marsh sediments, one Corrective Action approach would be to remove the sediments, necessitating disruption of the marsh. Since the effectiveness of remediation at the adjacent upstream/upgradient source areas is unknown, there is the reality of continued accumulation of constituents following any remedial activity in the marsh. If the marsh sediments pose an unacceptable risk, OxyChem will include a section on risk management in the CMS to evaluate the risk posed by the marsh sediments against potential remedial actions and wetland disruption.

Summary

With the above approach, OxyChem feels we can quickly move ahead on the project without the need for an onsite baseline risk assessment, additional source area delineation or micro-scale hydrogeologic study. The site remediation practice has advanced over the past 20 years since RCRA was adopted such that the likely remedial option for any given site, physical setting and appropriate data set can be identified early in the process without the need for the level of study undertaken in the early stages of the practice. OxyChem views the Delaware City RFI within this perspective. EPA has also recognized this advancement in the practice through the approval of screening technologies and focused remedial studies. While this approach my not be typical of other projects, OxyChem has learned through its consultant that a similar approach was utilized and accepted by EPA Region III on at least one other Region III project in Southeastern Pennsylvania. In that project the data and risk screening efforts provided a clear indication that Corrective Action was needed and the physical circumstances and data necessitated what needed to be done without the need for a formal risk assessment as a remedy decision tool.

If you have any questions, please do not hesitate to call. I can be reached at (972) 404-2444.

Sincerely,

Ukun F. Waterfaise

Alan F. Weston, Ph.D.

Director,

Remedial Programs

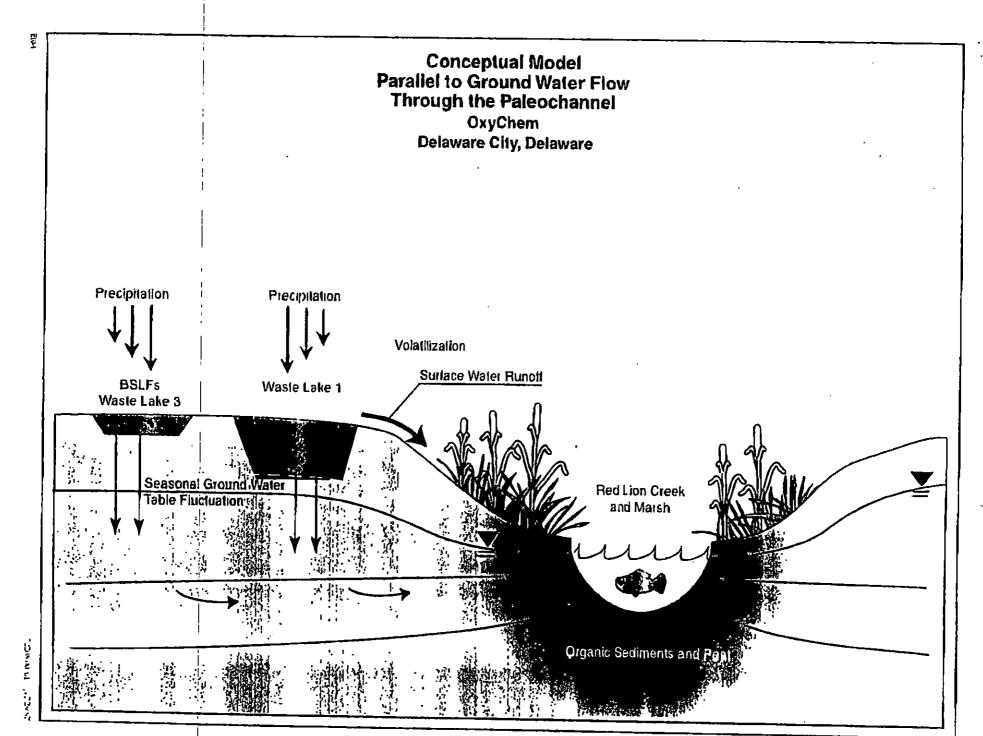
AW/

cc: EPA, Bob Greaves

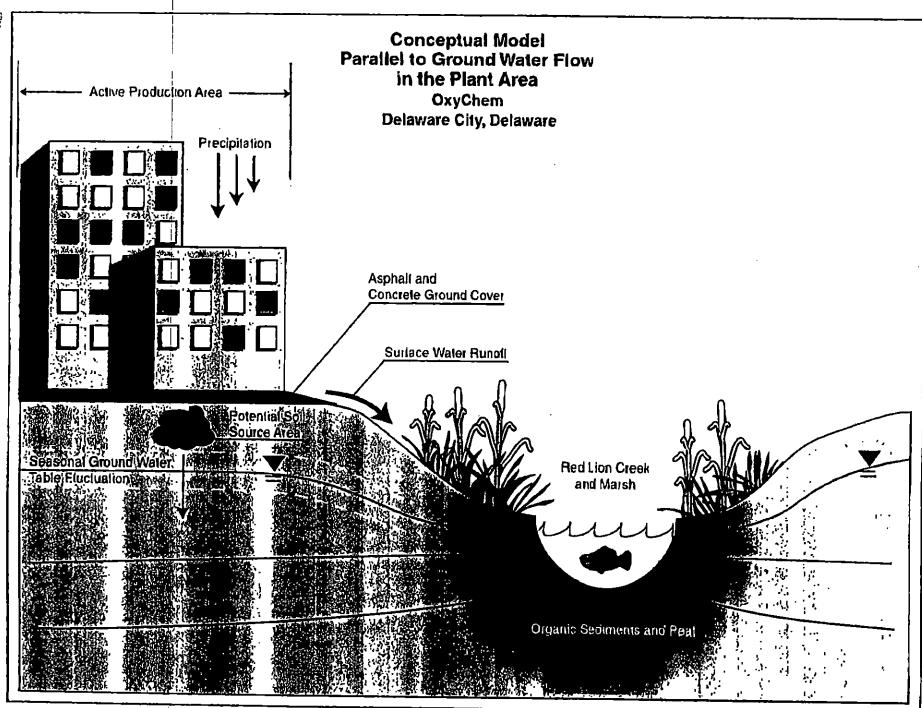
DNREC, Mark Davis

attachments: 2 site conceptual models









215 566 3113 P. 22/25

7462



United States environmental protection agency FIERION III 841 Cheetrat Building Philadelphia, Pennsylvenia 18107-4431

EPA RCRA

Date: FedEx:

VIA TELEPAX AND CERTIFIED MAIL RETURN RECEIPT REQUESTED

August 12, 1997

Alan F. Weston, Ph.D. Oscidental Chemical Corporation Occidental Towar, 5005 LBJ Freeway P.O. Box 809050 Dallas, TX 75380-9050

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ME: August 5, 1997 Meeting with EPA Region III and DMREC Occidental Chemical Corporation, Delaware City, Delaware RCRA

Dear Mr. Weston:

Facility

The purpose of this letter is to confirm and document the issues that were discussed during our August 5, 1997 meeting on the RCRA Corrective Action project at the Delaware City OxyChem Facility. EPA appreciated the opportunity to meet with you and your consultant to discuss the direction of the RFI project and Occidental's preferred approach for implementing corrective action at the facility.

EPA was very encouraged by your interest in moving forward with the project and by Occidental's commitment to remediating the site. As discussed at the meeting, there are tools available under the Consent Order (i.e., interim measures, stabilization measures) that can allow Occidental to move forward with certain remedial measures at the Delaware City Facility prior to the completion of the RFI. EPA strongly supports the use of interim actions to reduce risks, prevent exposure, and control or reduce continuing releases of contaminants from soils to surface and groundwater. EPA welcomes the submittal of interim measures proposals for this Facility, as long as they are technically sound, appropriate for the facility-specific conditions, and consistent with any long-term remedy for the site. Please note that EFA also expects Occidental to address the remaining data

215 566 3113 P.03/25

Alon F. Westen, Ph.D. Page 2 August 12, 1997

gaps in the site characterization work (see EPA's May 29, 1997 letter), and to complete a full evaluation of the sources and extent of contamination and the potential impacts to human and ecological recaptors at the Facility and in the marsh, watlands, and general areas surrounding Red Lion Creek.

As indicated during our meeting, Occidental believes that the site is characterized sufficiently to move forward with the evaluation and potential implementation of specific remedial measures for waste management units and known areas of contemination at the Facility. The following includes a summary of the proposed remedial approach Occidental described during our August 5 meeting:

For Soil

a)On-site, implace containment measures (i.e., capping, insitu fixation) would be evaluated and used to eliminate
infiltration, volatilization, and direct contact risks from
select swmus located outside the process area (waste take-1,
Waste Lake-3, Old Brine Sludge Landfill). As stated at our
meeting, Occidental is willing to implement remedial measures now
to address each of the units in its entirety (based on existing
design and construction documents), with additional
characterization implemented as necessary to further delineate
(or confirm) the boundaries of the unit, but without completing
any further source area delineation.

b) Source control measures for the process area at the Facility would include making use of the existing paving (95% of area covered by asphalt or concrete) as some measure of containment, and downgradient groundwater monitoring to detect any releases from the units (wastewater treatment plant, standard chlorine pipeline, carbon tetrachloride unit). As previously agreed, additional source area investigation and abatement may be required for these units depending upon the groundwater quality and monitoring results from the Phase II installation and sampling of downgradient wells. In-addition, Occidental has proposed the use of Institutional Controls (i.e., access control via existing security gates, deed restrictions, standard operating procedures to reduce/prevent releases in process area) to supplement the proposed source control measures.

c) Excavation, in-place containment, and in-mitu fixation will be evaluated for the Chemfix unit, and;

Alan F. Weston, Ph.D. Page 3 August 12, 1997

d) Additional characterization work will be completed to delineate the degree and extent of soil contamination present at Waste Lake-2.

For Groundwater

e) Following containment/excavation of soil sources, groundwater controls such as an interceptor trench, passive barrier, and hydraulic barrier would be evaluated for use at the downgradient edge of the active process area(s), but upgradient of the wetlands, to remediate groundwater beneath the Facility and to prevent future migration of contaminants from the source areas into the wetlands and Red Lion Creek. It is EPA's position that more characterization of the hydrogeologic conditions beneath the Facility will be required to effectively evaluate and design such a remedial system.

Please note that, any remedial actions implemented by Oxychem must be accompanied by stormwater control measures to prevent any further impacts to the marsh and wetlands surrounding Red Lion Creek.

We hope this accurately characterizes the discussion and presentation provided by ERM at our August 5 meeting. If not, please respond in writing to clarify any specific items. EPA expects any response, if necessary, to be submitted on September 5, 1997 with the responses to comments on the Phase II RFI Workplan, to ensure that we are all moving ahead with the mame objectives in mind.

It is EPA's understanding that the next steps for the RFI project include Occidental's submittal of responses to the comments provided in our May 29, 1997 letter. These responses are due to EPA by September 5, 1997, With the completion of the additional characterization work identified in EPA and DWREC's May 29, 1997 comment letter, and the ecological assessment work required by Phase III of the RFI, sufficient information should be available to address our remaining concerns and to provide a sound technical basis in support of the remedial approach proposed by Occidental. As indicated during our masting, the additional characterization work is also required to confirm and support the presence of the paleochannel beneath the site, and the conceptual groundwater flow model Occidental has developed for this facility. EPA also has some concerns regarding whether the overall approach will be appropriate to protect the ecosystem that is situated adjacent to and downgradient from the site.

Alan F. Weston, Ph.D. Page 4 August 12, 1997

Depending upon what we find during the completion of the Phase II and III RFI work, the remedial approach proposed by Occidental may need to be revised to address potential long-term impacts to the ecosystem.

In addition, EPA expects to receive a proposal from Occidental for completion of interim actions or stabilization projects that would include some or all of the remedial measures described above. If you would like to discuss this further, please feel free to contact me and we can make arrangements for a conference call.

Please note that we dannor formally respond to your proposal to eliminate the Baseline Risk Assessment (see July 31 letter from Occidental to EPA) from this project until we have an opportunity to discuss this matter internally and get feedback from our RCRA Program management. We will contact you once we have completed our discussions.

This concludes our summary of the August 5, 1997 meeting between Occidental, EPA and DNREC. Please contact me at (215) 566-3427 if you have any questions regarding this letter.

Sincerely,

Dona McCartney, 3HW96

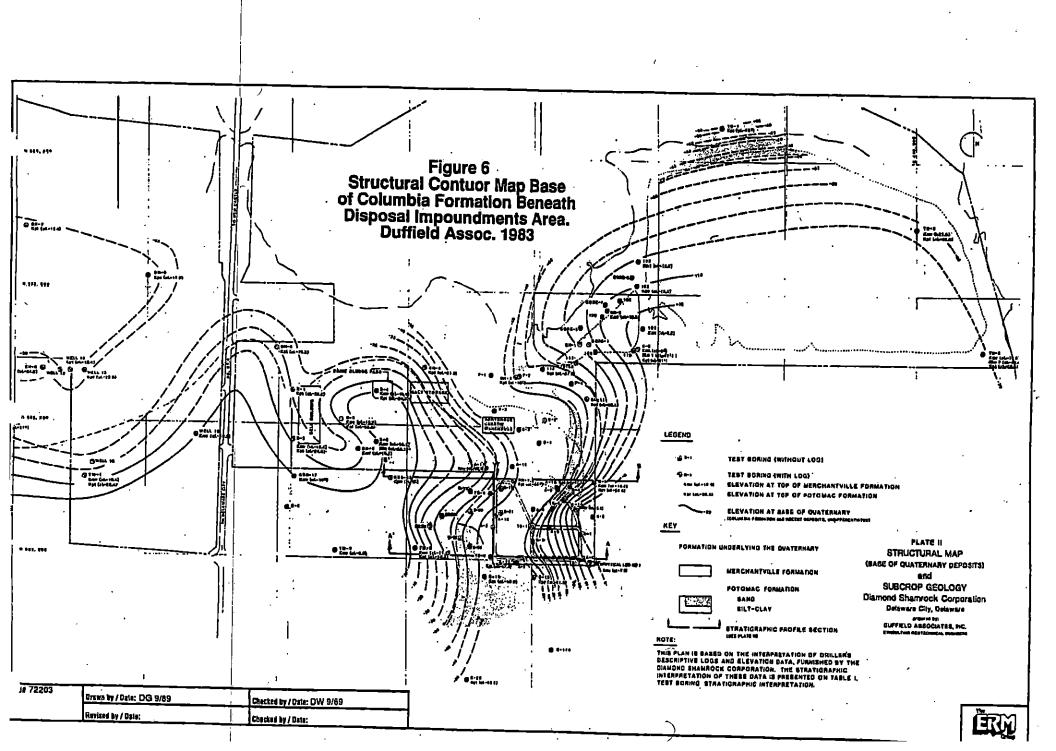
USEPA Project Manager

cc: B. Greaves, 3HW90

- D. Goldblum, 3HW90
- R. Prince, 3HW70
- A. Rittberg, DNREC
- E. Schiela, USACE

APPENDIX B

DUFFIELD ASSOCIATIES STRUCTURAL GEOLOGIC MAP OF THE BASE OF THE COLUMIBA FORMATION

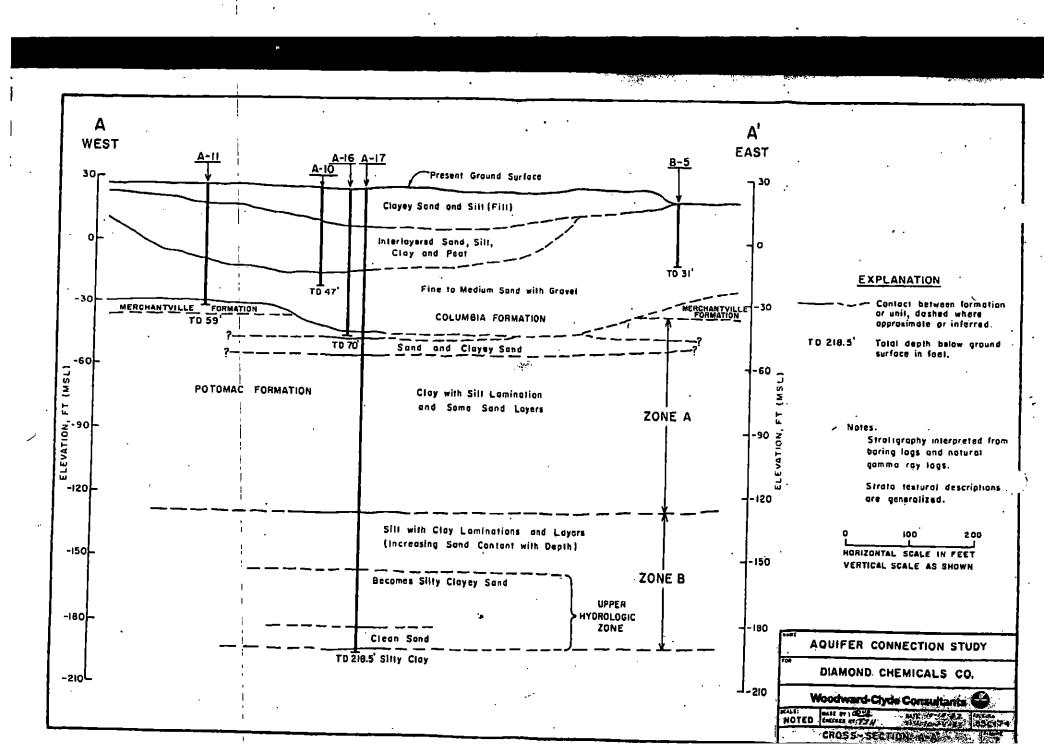


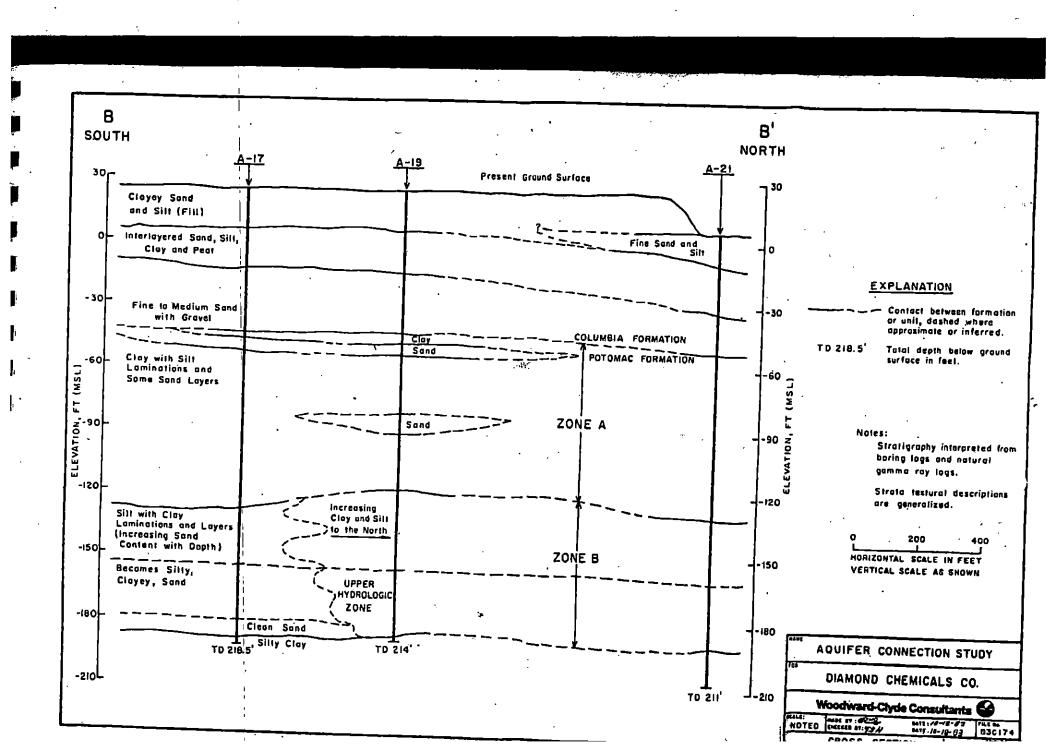
APPENDIX C

WOODWARD-CYLDE CROSS-SECTION
AT SITE

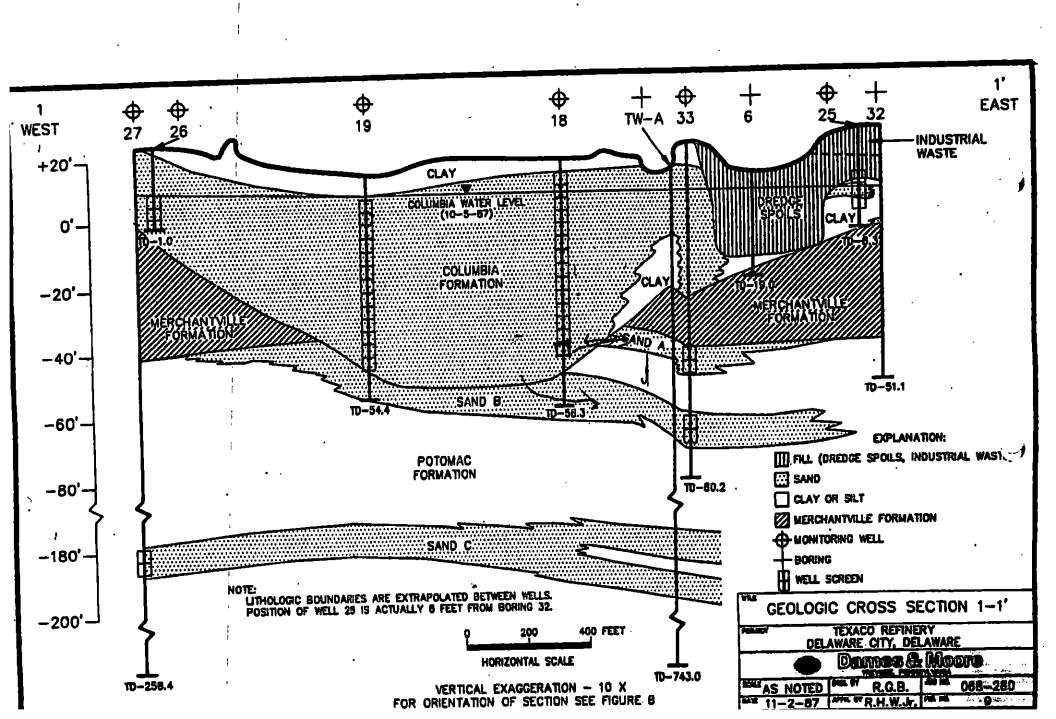
APPENDIX C

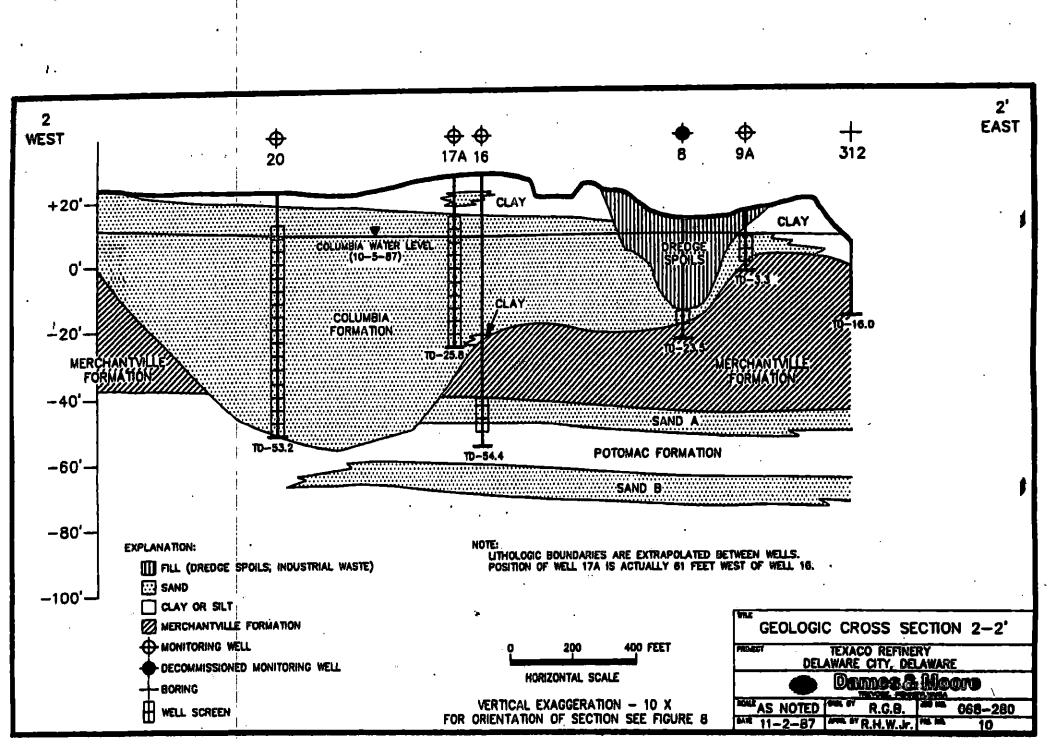
WOODWARD-CYLDE CROSS-SECTION AT SITE

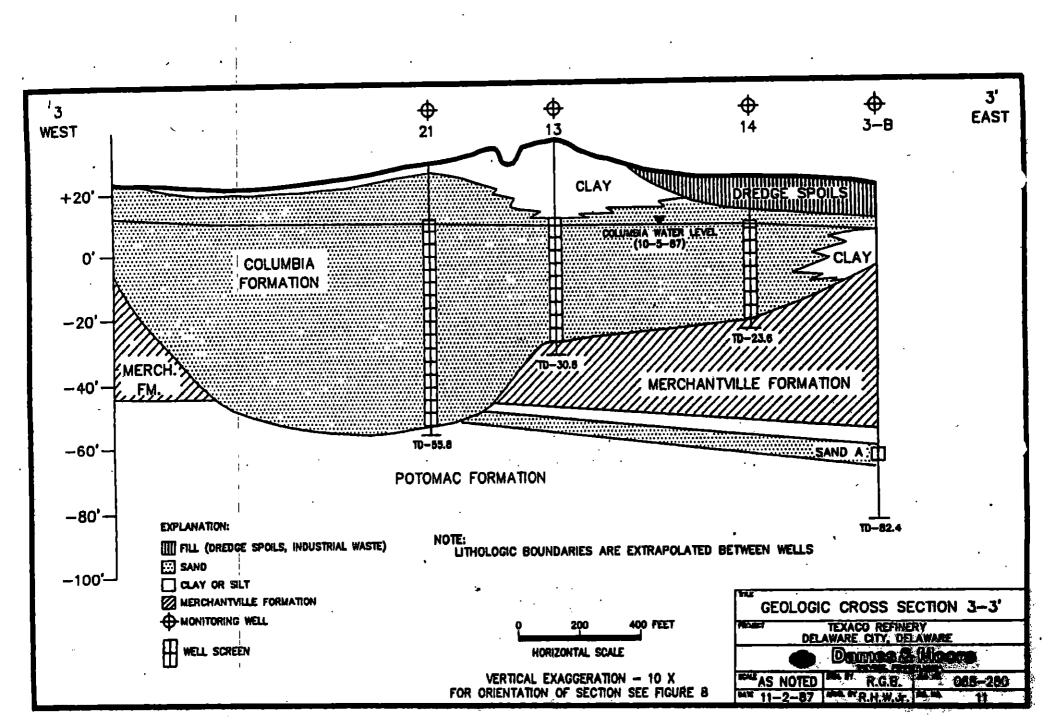


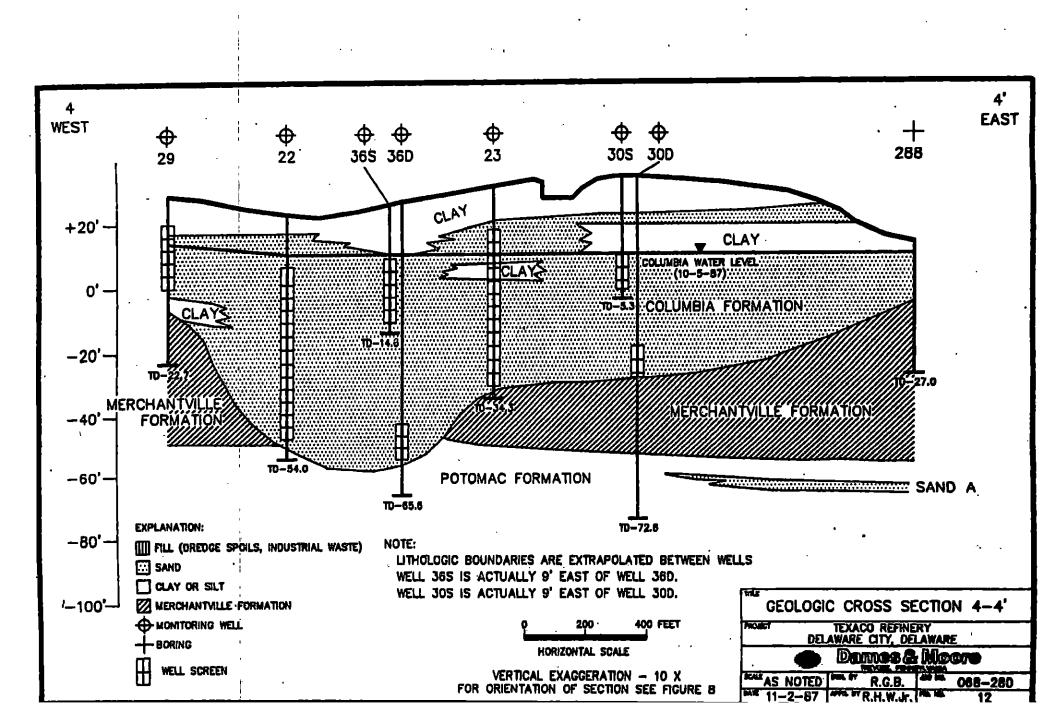


APPENDIX D DAMES & MOORE GEOLOGIC CROSS-SECTION SHOWING THE COLUMBIA FORMATION CHANNEL GEOMETRY AT STAR









APPENDIX E

PRELIMINARY RBC SCREENING OF PHASE I DATA

	•		USEPA Soil Screenin
Constituent	Maximum	USEPA Region	Levels for Transfers
	Concentration	III RBC *	to Ground Water
WASTELAKE 1		-	
Soil/Waste (concentrations in mg/kg)			
benzene	1800	22	0.02
chlorobenzene	3400	1600	20.6 *
vinyl chloride		0.34	0.01
2-chloroethylviny ether	0.059	2000	. NA
1,2-dichloroethene, total	(0.27)	700	
trichloroethene	4 20.03	58	0.02
1,3-dichlorobenzene	1700	7000	NA
1,4-dichlorobenzene	9500	VD_{ij}	and the second
1,2-dichlorobenzene	P 7000	7000	
1,2,4-trichlorobenzene	3001	7 80	North 2 North
hexachlorobenzene	40	2 0.4	[‡] 08 [‡] 0.
bis(2-ethylhexyl)phthalate	28100	46.4	4 3 3 3 3 3 3 3 3 3
arsenic	. 448	0.43	15
barium	8700	2 35500	32
beryllium	0.63	40.15	180
cadmium	69. +	39	6
chromium	1300	(126) 390 PF 9	erio in inches
copper	500	3100	NA
iron	23800	22000	NA
lead	220	400	, NA
manganese	260	1800	NA
mercury	42000	E 78	NA .
nickel	d10 ≥ o=	1600	21
silver	9.6	390	NA
sodium	13000	NA	NA
zinc	1700	23000	42000
Ground Water (concentrations in µg/L)			
vinyl chloride	7. F26	0009	N/A
chloroform	12.	6475 X015 S	N/A
benzene	62000	0.36	N/A
chlorobenzene	170000	\$ 82.39 Yes	N/A
methylene chloride	140 * \$	1541	N/A

Comparison of Maximum Phase I Concentrations to USEPA RBC Screening Levels Occidental Chemical Corporation Delaware City, Delaware

,		1	USEPA Soil Screenir
Constituent	Maximum	USEPA Region	Levels for Transfer
	Concentration	III RBC *	to Ground Water
WASTE LAKE 1			-
Ground Water (concentrations in µg/L)			
1,3-dichlorobenzene	#\$1800.00	. €4 na 1540	N/A
1,4-dichlorobenzene	22000	rs: 0.044	N/A
1,2-dichlorobenzene	218000	ect: 270 07.	N/A
1,2,4-trichlorobenzene	3300	جيد 190 توريد	N/A
bis(2-ethylhexyl)phthalate	620	48	N/A
Total Metals			
arsenic	1020	0.045	N/A
barium	355	2600	N/A
cadmium	7. 3	18	N/A
chromium	43961	180 .5-4	N/A
copper	239	1500	N/A
iron .	342000	11000	N/A
lead	7 35 A	35 F15 F	N/A
manganese	¥46200 C	840	N/A
mercury	248	37	N/A
nickel	192	73 0 .	N/A
sodium	1690000	NA	N/A
zinc	683	11000	N/A
Dissolved Metals			
arsenic	650	7 0.045	N/A
barium	317	2600	' N/A
iron	5900	11000	N/A
manganese	38700	504 P.0502	N/A
mercury	64.1		N/A
sodium	2280000	МÁ	N/A
zinc	86.9	11000	N/A

WASTE LAKE 2

Soil/Waste (concentrations in mg/kg)

benzene -	516	22	3,002
chlorobenzene	290	1600	06
methylene chloride	0.004	85	0.01
toluene	0.006	16000	5
trichlorofluoromethane	0.0196	23000	13
1,3-dichlorobenzene	8.8	7000	NA

Constituent	Maximum Concentration	USEPA Region III RBC *	USEPA Soil Screening Levels for Transfers to Ground Water
WASTE LAKE 2	Concentration	III KBC	to Ground Water
Soil/Waste (concentrations in mg/kg)			
1,4-dichlorobenzene	TY/0	27	
1,2-dichlorobenzene	31400.0	7 000	eri ana
1,2,4-trichlorobenzene	100	7 80	
bis(2-ethylhexyl)phthalate	1	46	11
di-N-butyl phthalate	0.14	7 800	120
butyl benzyl phthalate .	0.92	16000	68
antimony	7.2	31	NA
arsenic	29	d 2043	(15)
barium	620	5500	2825377
beryllium	75 75 75 75	0.45 (£0.45)	180
cadmium	3	39	6
chromium	10.25	390	51;=//: 2 39
copper	63	3100	NA
iron	35000	28000	NA
lead	190	400	NA
manganese	4200	1800	NA
mercury		78	NA
nickel	40	1600	21 1
sodium	18000	NA	NA
zinc	420	23000	42000
Ground Water (concentrations in µg/L)			•
chloroform			N/A
Total Metals			IVA
arsenic	a and a		N/A
barium	1230	2600	N/A
chromium	62.9	180	N/A
copper	53.5	1500	N/A
iron	192000	1000	N/A
	153000	840	N/A
manganese nickel	94.2	730	N/A
	3290000	NA	N/A
sodium	•		N/A N/A
zinc	124	11000	IN/A

			USEPA Soil Screening
Constituent	Maximum	USEPA Region	Levels for Transfers
	Concentration	III RBC *	to Ground Water
WASTE LAKE 2			
Ground Water (concentrations in µg/L)			
Dissolved Metals			
barium	1230	2600	N/A
chromium	25.4	180	N/A
iron	192000	11000	N/A
manganese	1157(000)	16294840 (€) (€)	N/A
nickel	93.9	73 0	N/A .
sodium	3770000	NA	N/A
zinc	95.3	11000	N/A
WASTE LAKE 3	16 24444 eo 254 agust wet 64 1 0 Da é 24 6 6 6 6 6 6 6 6 6 6 6 6 6 6	1 ,422120 21200	######################################
Soil/Waste (concentrations in mg/kg)			
vinyl chloride	2900	Car 20844 8	
chloroethane	2.1	31000	33
methylene chloride	0.66	85	i de la companya de l
1,1-dichloroethane	0.03	7800	11
1,2-dichloroethene, total	0.084	7 00	NA
chloroform	0.035	100	. 0.3
trichloroethene	e 0:11	58	0.02
benzene	0.07	22	0.02
tetrachloroethene	0.06	12	.0.04
toluene	0.023	16000	• 5
chlorobenzene	24 TO 1/4 TO 1	1600	72 70 6π. et-
bis(2-ethylhexyl)phthalate	1 030	2.46	· die
indeno(1,2,3-cd)pyrene	36.3	4445088	C. 4. 35 P. V.
dibenz(a,h)anthracene	96	€ \$0.088 ° ;	11
benzo(g,h,i)perylene	45	NA	NA
antimony		4578 E 2311 E SV	· NA
arsenic	6.2	23	15
barium	774	5500	32
<u>cadmium</u>	1.5	" 39	6
chromium	79	390	<u> </u>
copper	36	3100	NA
iron	23000	23000	NA
lead	580	400	NA
manganese	510	1800	NA

Comparison of Maximum Phase I Concentrations to USEPA RBC Screening Levels Occidental Chemical Corporation Delaware City, Delaware

Constituent	Maximum		USEPA Soil Screenin Levels for Transfers to Ground Water
WASTE LAKE 3	Concentration	III KBC *	to Ground water
Soil/Waste (concentrations in mg/kg)			
mercury	\$ 31400 S	7.8	NA
nickel	20	1600	21
sodium	1400	NA	NA
zinc	78	23000	42000
Ground Water (concentrations in µg/L)	•		•
chlorobenzene	15	39	N/A
1,4-dichlorobenzene	4.6	0.44	N/A
1,2-dichlorobenzene	3.5	270	N/A
bis(2-ethylhexyl)phthalate	722	28.29.048 VALVE	N/A
Total Metals	The Property of the State of th	Milliantine Title VAIII validar is 4 million of 1	
iron	27 9	11000	N/A
manganese	99.4	840	N/A
selenium	17.8	180	N/A
sodium	332000	NA	N/A
zinc	273	11000	N/A
Dissolved Metals			
selenium	16.5	180	N/A
sodium	386000	NA	N/A
zinc	105	11000	N/A

CHEMFIX TEST UNIT

Soil/Waste (concentrations in mg/kg)

vinyl chloride
chloroform
1,2-dichloroethane
1,2-dichloroethene, total
benzene
chlorobenzene
ethylbenzene
trichloroethene
tetrachloroethene
arsenic
barium
beryllium

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		1	USEPA Soil Screening
Constituent	Maximum	USEPA Region	Levels for Transfers
	Concentration	III RBC *	to Ground Water
CHEMFIX TEST UNIT			
Soil/Waste (concentrations in mg/kg)			
cadmium	1.2	39	6
chromium	19	390	19
copper	14	3100	NA
iron	21000	23000	NA
lead	24	400	ΝA
manganese	1600	1800	NA
mercury	80	78	NA
nickel	17	1600	21
sodium	3700	NA	NA
zinc	88	23000	42000
Ground Water (concentrations in µg/L)	•		
vinyl chloride	4150	F: 0.01975 #	N/A
chloroform	-114	0 15	N/A
carbon tetrachloride	180	016	N/A
tetrachloroethene	4.		N/A
Total Metals			
arsenic	17.9	(# (* (D.045)	N/A
. chromium	23.5	180	N/A
iron	5430	11000	N/A
manganese	320	840	N/A
mercury	7.6		* N/A
sodium	477000	NA	N/A
zinc	43.1	11000	N/A
Dissolved Metals			
arsenic	4.4.6	0025	N/A
chromium	21.7	180	N/A
manganese	95.8	840	N/A
mercury	160 87 3 3	A 257	N/A
sodium	511000	NA	N/A
zinc	49.6	11000	N/A

			USEPA Soil Screenin
Constituent	Maximum	USEPA Region	Levels for Transfers
	Concentration	III RBC •	to Ground Water
NEW BRINE SLUDGE LANDFILL	-		
Ground Water (concentrations in µg/L)			
bis(2-ethylhexyl)phthalate	4.6	4.8	N/A
Total Metals			
barium	318	2600	N/A
chromium	11. 7	180	N/A
copper	31.2	1500 ·	N/A
iron	34000	3.000	N/A
lead	11.5	15	N/A
manganese	10500	8400	N/A
mercury	48	9789	N/A
selenium	17.2	180	N/A
sodium	479000	NA	N/A
zinc	482	11000	N/A
Dissolved Metals			
barium	221	2600	N/A
iron	77.419300).a	SS (5-2-01000)	N/A
manganese	10200 €	1 1840	N/A
mercury	47	9.507/25	N/A
selenium	13.4	180	N/A
sodium	546000	NA	N/A
zinc	27 2	11000	N/A
OLD BRINE SLUDGE LANDFILL	, til gå unår åd, nors e på trjå få på t e d trå f å dyd a på t	***************************************	,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Soil/Waste (concentrations in mg/kg)		•	
vinyl chloride	21077	វីកាន្តមិននឹង	6 0.01
ahlavafava	760	100	LEGIS WHEN THE PRINCIPLE

vinyl chloride
chloroform
benzene
tetrachloroethene
bis(2-ethylhexyl)phthalate
antimony
arsenic
barium
beryllium
cadmium
chromium

3 400	n= 0345=	~ 200
0.89	100	E. 1 103
38	22	4 = 4 color= 1 = 1 = 1
19 3	12	30.045
4.990	46.17	
23	31	NA
23	OT.	NA.
25 246	31 1-21-28 8 8	/\/ /
24.6 24.6 690	23 5500	15 132
24.6 690 0.74	223	15 32 180
24.6 690 0.74 2.8	223	15 32

		. 1	USEPA Soil Screening
Constituent	Maximum	USEPA Region	Levels for Transfers
	Concentration	III RBC *	to Ground Water
OLD BRINE SLUDGE LANDFILL			
Soil/Waste (concentrations in mg/kg)			
copper	130	3100	NA
iron	15500	23000	NA
lead	1 7 0	400	NA
manganese	15 90	1800	NA
mercury	24400 P.S.	7/8	NA
nickel	35	1600	217
sodium	12000	NA	NA
zinc	1100	23000	42000
Ground Water (concentrations in µg/L)			
diethyl phthalate	2.3	29000	N/A
Total Metals			
barium	215	2600	N/A
iron	.33000	in 11000	N/A
lead	7	NA	N/A
manganese	7880	Si - 840 % ***	N/A
mercury	0.5	3.7	N/A
nickel	53.5	73 0	N/A
sodium	793000	NA	N/A
zinc	82.7	11000	N/A
Dissolved Metals			,
barium	230	2600	• N/A
iron	27800	11000	N/A
manganese	7280 (± /)	840	N/A
nickel	51.1	73 0	N/A
sodium	9 7 9000	NA	N/A
zinc	68.9	11000	N/A
FORMER DRAIN POND SOUTH OF V	VASTE LAKE 1		***************************************
Soil/Waste (concentrations in mg/kg)			
arsenic	2.9	23	15
barium	3 9	5500	62
beryllium	0.89	\$ 1(0;15) is \$	180
chromium	351	390	193
iron	17000	23000	· NA
lead	35	400	NA

Comparison of Maximum Phase I Concentrations to USEPA RBC Screening Levels Occidental Chemical Corporation Delaware City, Delaware

Constituent		•	USEPA Soil Screening	
	Maximum	USEPA Region	Levels for Transfers	
	Concentration	III RBC •	to Ground Water	
FORMER DRAIN POND SOUTH OF V	VASTE LAKE 1		<u></u>	
Soil/Waste (concentrations in mg/kg)	•			
manganese	540	1800	NA	
mercury	3.3	7. 8	NA NA	
nickel	18	1600	21	
sodium	280	NA	NA	
zinc	1 7 0	23000	42000	

Notes:

NA = Not Available

N/A = Not Applicable

^{* =} Tap water risk-based concentrations (RBCs) used to compare to ground water concentrations.

Residential soil RBCs used to compare to soil concentrations.

APPENDIX F

JUSTIFICATION OF NON-RESIDENTIAL USE STANDARD FOR THE SITE



JUSTIFICATION FOR A FUTURE INDUSTRIAL USE SCENARIO FOR THE SITE

Corrective Action Program
Occidental Chemical Corporation
Delaware City, Delaware

TABLE OF CONTENTS

EXE	CUTIVES	GUMMARY	<u>Pag</u>
EXE	CUTIVES	SUMMARY	4
1.0	INTRO	1	
	1.1	PURPOSE	1
	1.2	BACKGROUND	1
2.0	SITE D	3	
	2.1	CURRENT SITE DESCRIPTION	
	2.2	HISTORICAL SITE DESCRIPTION	4
3.0	CURRE	ENT SURROUNDING LAND USE	9
	3.1	LAND USE	9
	3.2	ERIIS DATABASE SEARCH	9
	3.2.1	FEDERAL DATABASES	9
4.0	POPUL	ATION INFORMATION	17
5.0	WATE	R USE	18
6.0	PROJEC	CTED FUTURE USE	21
70		LISIONS	

LIST OF FIGURES

FIGURE 1 SITE LOCATION MAP

FIGURE 2 SITE FACILITIES MAP

FIGURE 3 LAND USE MAP

FIGURE 4 POTOMAC FORMATION WELL LOCATIONS AND 1995 WITHDRAWALS

TABLES

TABLE 1 1990 POPULATION OF TRACTS 164 AND 165 BY AGE DISTRIBUTION

TABLE 2 DNREC WATER USE DATA - 1995

EXECUTIVE SUMMARY

The Delaware City Plant is located approximately three miles northwest of Delaware City, Delaware in a heavily industrial and commercial setting surrounded by rural agricultural land. The plant processing area, which occupies approximately 21 acres of the 300-acre property, manufactures chlorine, hydrogen, sodium hydroxide, and potassium hydroxide by the electrolysis of NaCl and KCl brines. In addition to the plant process area, the facility consists of several landfills, waste lake units, and a marsh area. The landfills and waste lakes are no longer used for disposal purposes. They have been capped and are overgrown with natural grass and/or phragmites. The remainder of the property consists of a marsh area between the plant process area and Red Lion Creek.

The Delaware City, Delaware Plant has been in operation since it was built in 1965 and is likely to remain an industrial facility. The Site is located in the middle of a large area consisting of heavy industry and commercial facilities to support the industry (e.g., transportation). Furthermore, the long time use of the Plant and surrounding area for heavy industry has led to a state of almost ubiquitous soil and shallow groundwater contamination. For these reasons, the concept of a residential area supplanting this heavy industrial area is not practical in the near or long term. In order for a residential area to supplant the present heavy industrial area, all or most of the sites would have to be remediated to residential standards. The projected future use of the Plant and large area surrounding the plant is for industrial purposes. This conclusion is consistent with EPA policy, which recognizes that RCRA facilities typically are industrial properties that are actively managed.

At this time, OxyChem plans to continue operation of the plant for the purpose of manufacturing chlorine into the foreseeable future. With regard to site-specific environmental issues, OxyChem plans to implement appropriate deed restrictions, engineering controls, and institutional controls, as required. Furthermore, the site may be divided into subsections allowing for various degrees of remediation. For example, deed restrictions and institutional controls may allow the manufacturing area to remain industrial.

Current groundwater usage in the surrounding area is also likely to continue. The Potomac Aquifers will be used as the major source of potable and industrial water. Use of the Columbia Aquifer for residential water supplies may continue. Presently all residential users are located north of Red Lion Creek, which acts as a hydrogeologic barrier to preclude any potential impacts to these wells from the OxyChem site. Future

residential development in the area, if any, would likely be served by a public water system deriving its water from the Potomac Aquifers or transmitted from another distant source via a pipeline. Pumping of the Columbia Aquifer to the south and west by Motiva (formerly Star) and Metachem (formerly Standard Chlorine) for remediation purposes does not influence groundwater at the OxyChem site. Continued pumping of the Columbia Formation by these facilities is not expected to influence the groundwater flow in the Columbia Formation at the OxyChem site, which is to the north with discharge to Red Lion Creek.

Based on the information presented in this justification document, OxyChem concludes that a non-residential use scenario is appropriate for site soils and groundwater. Part 1 of the Phase III risk assessment will be a pathway analysis for on-site areas of the facility. Under a Corrective Action program, exposure points along each pathway will be eliminated through institutional or engineering controls. As a component of this analysis, OxyChem will assume a non-residential use scenario for site soils and groundwater.

1.0 <u>INTRODUCTION</u>

1.1 PURPOSE

The purpose of this document is to provide justification for a future non-residential use scenario for soils and groundwater at Occidental Chemical's Delaware City, Delaware facility. EPA recognizes that RCRA facilities typically are industrial properties that are actively managed. Therefore, consideration of non-residential (industrial) uses is especially likely to be appropriate for RCRA facility cleanups (OSWER Directive No. 9355.7-04).

1.2 BACKGROUND

A preliminary, conservative risk screening using worst case residential RBCs and Phase I data suggests that remediation may be required at several SWMUs. Along with the recently collected Phase II data, OxyChem believes it has sufficient data and information on these SWMUs with which to evaluate potential remedial alternatives. Likely remedial options have been identified that will serve to manage the risk by eliminating the constituent migration pathways at each SWMU. Therefore, the need for a baseline risk assessment becomes much less critical since it is not needed as a decision making tool to evaluate potential Corrective Action. This approach is consistent with the draft 1990 Proposed Corrective Action Rule, which endorses risk screening as a tool for evaluating Corrective Action. EPA is evaluating this approach as presented in OxyChem's July 31, 1997, letter regarding OxyChem's proposed corrective action approach for the site and as discussed at the subsequent August 5, 1997 meeting between EPA, OxyChem and DNREC. OxyChem further described the proposed risk screening approach in the July 17, 1998 Phase II RFI Work Plan.

The Phase III risk assessment will be divided into two parts both of which would be conducted concurrently. Part 1 will be a pathway analysis for on-site areas of the facility, while Part 2 will entail a risk assessment for off-site areas. Under a Corrective Action program, exposure points along each pathway will be eliminated through institutional or-engineering controls. This document focuses on Part 1. A component of the Part 1 analysis will be based on a non-residential scenario as a reasonable future use for site soils and groundwater. OxyChem believes that a non-residential use scenario is the most appropriate for site soils and groundwater.

As per the Phase II RFI Work Plan, data were collected to support the evaluation of a non-residential use scenario for the site. State and county agencies were contacted to collect the necessary data. Information evaluated included zoning maps, community master plans, population projections, infrastructure, and social, cultural and historical issues. Information regarding the continuing non-residential use of the site, and the plant's position in this industry was also included. This report presents the information to justify a future non-residential use scenario for site soils and groundwater.

2.0 SITE DESCRIPTION

2.1 <u>CURRENT SITE DESCRIPTION</u>

The Delaware City Plant is located approximately three miles northwest of Delaware City, Delaware in a heavily industrial and commercial setting surrounded by rural agricultural land. A site location map is presented in Figure 1. The plant manufactures chlorine, hydrogen, sodium hydroxide, and potassium hydroxide by the electrolysis of NaCl and KCl brine.

Figure 2 provides a site facilities map. The facility is situated on a 300-acre (approximate) tract of land 3.5 miles northwest of Delaware City, Delaware in New Castle County. The facility's processing area occupies approximately 21 acres of the 300-acre property. In addition to the plant process area, the facility consists of several landfills, waste lake units, and a marsh area. Two landfills, the Old Brine Sludge Landfill and the New Brine Sludge Landfill, are located at the south central portion of the property and occupy a combined area of approximately 7 acres. Three waste lake units, Waste Lakes 1, 2, and 3, are located at the central and eastern portion of the property and occupy a combined area of approximately 53 acres. The landfills and waste lakes are no longer used for disposal purposes. They have been capped and are overgrown with natural grass and/or phragmites. The remainder of the property consists of a marsh area between the plant process area and Red Lion Creek.

Red Lion Creek, a tributary of the Delaware River, and surrounding marsh lie immediately north of the eastern portion of the property. Two commercial packaging and transport companies, Chloromone and Oriole Chemical Carrier, lie immediately north on the western portion of the property between the plant and the marsh. The east side of the property is bounded by the Delaware River. Keneka of Delaware, Inc., (formerly Georgia Gulf) which operates the PVC plant, is located to the immediate South, and Metachem is located to the west.

Red Lion Creek is a small tidal tributary to the Delaware River that discharges through tide gates to the Delaware River (Mile 62). The 100-year flood plain in this area is 10 feet above mean sea level. The flood plain in this area is currently protected against tidal fluctuations of the Delaware River by a dike and tidal gate. The plant process area and all waste management areas are diked and outside of the 100-year flood plain.

The portion of the river near the Site is considered the Brackish Upper Estuary. The salinity of the river varies seasonally. During periods of high river flow, which usually occur in the spring, the river has been freshwater as far south as the Chesapeake and Delaware Canal, approximately 3.5 miles downstream of the facility (River Mile 58.5). During droughts, saline water has reached Philadelphia, approximately 25 miles upstream.

The natural shoreline of this section of the river was once predominantly tidal marshes. The Brackish Upper Estuary was a transition zone between freshwater and brackish water species. Above the marshes at higher elevations, dense coastal forests and forested wetlands were present. This forest has largely been removed and converted to agricultural, residential, commercial, and industrial uses, but remnants remain. Likewise, the tidal marshes have been altered to support development.

2.2 <u>HISTORICAL SITE DESCRIPTION</u>

The plant began operation in 1965 under the ownership of Diamond Alkali, and has since undergone several name changes and one ownership change. The plant was owned by Diamond Shamrock Corporation when its waste facilities were permitted by the State of Delaware Department of Natural Resources and Environmental Control (DNREC) in 1979 under Solid Waste Permit SW-79/13. The ownership of the plant was transferred to OxyChem in 1986. The following provides a description of historical plant use including the plant process area, landfills and waste lake units.

Plant Process Area

Since 1965 when the Plant was built and operated by Diamond Shamrock, it has manufactured chlorine, hydrogen, and sodium hydroxide by the electrolysis of NaCl brine. A potassium hydroxide production unit was added to the plant in 1996. From 1966 to April 1982, the Plant also operated a polyvinylchloride (PVC) plant, which manufactured homopolymer resins. This PVC plant is located south of the chlorine production area and is currently owned by Kaneka of Delaware. Prior to the development and permitting of wastewater treatment facilities at the Delaware City Plant, and disposal of solid wastes at an off-site facility, solid wastes from the chlorine and PVC production processes were placed in disposal impoundments (landfills) and process effluent was settled in lagoons (waste lakes) at the site.

Waste Lake No. 1

Waste Lake No. 1 (WL-1) is a 2.3 acre triangular shaped landfill on the north side of the facility, adjacent to, and south of, Red Lion Creek. It is no longer in use and in 1979 was dewatered and capped with 12 to 24 inches of clay and 4 inches of topsoil.

From 1965 to 1970, WL-1 received influent containing PVC solids, barium sulfate, calcium sulfate, carbonates, chlorides, and mercury, in various states and forms. Wastestream flows to the lake included caustic railroad tanker and truck washings, cooling tower blowdown and other general facility washdowns. In the fall of 1970, the influent was reduced to a sodium hydrosulfide treated mercury contaminated wastewater steam and the influent from MetaChem. The unit had a waste capacity of approximately 35,000 cubic yards.

From summer 1965 to spring 1971, WL-1 was also used as a flow-through basin by Metachem, which discharged wastewaters from its chlorobenzene process to the Delaware River. OxyChem did not provide treatment for this wastewater, but merely a flow channel to allow Metachem access to the Delaware River through WL-1 and the overflow channel.

Historical investigation data indicates that several constituents have migrated from WL-1 via groundwater to the northwest and are bound in the silty clay sediments and peat deposits in the marsh adjacent to this unit.

Waste Lake No. 2

Waste Lake No. 2 (WL-2) is a 48-acre lagoon in the northeast corner of the facility, just east of WL-1. It is bordered on the east by the Delaware River and on the north by Red Lion Creek. This unit had a volume of approximately 240 acre-feet, with a depth that varied from 2 to 10 feet.

Prior to the end of 1970 it was used by Motiva as Delaware River as a dredge disposal area. From 1965 to 1977, WL-2 primarily received stormwater runoff from surrounding areas and overflow wastewater from WL-1. WL-2 also served as a water retention and evaporation lagoon and a "no discharge" lagoon to store treated facility wastewater. In the late 1960s, solid wastes from WL-1 were placed in the southwest corner of WL-2 to enable additional solids settling in WL-1. In the early 1970s, PVC solids were discharged directly into the Southwest Corner of WL-2. Process water from Metachem was also

channeled through the unit from 1971 to 1973. During the period of 1977 to 1983, WL-2 was drained under an NPDES permit and dried. A soil cap was completed in 1983. Several areas within this unit were sampled during Phase I and showed elevated total VOC and SVOC concentrations.

Waste Lake No. 3

Waste Lake No. 3 (WL-3 or PVC Landfill) is a 3.1-acre elongate shaped landfill located approximately 200 feet southwest of WL-1. From 1970 to 1982, WL-3 received approximately 35,000 cubic yards of wastes from the PVC processing area. A low-permeability soil cap was completed in 1982.

From 1982 to 1988, post-closure requirements required monitoring pursuant to a DNREC solid waste permit. No chemicals of concern were detected during the monitoring program.

Old Brine Sludge Landfill

The Old Brine Sludge Landfill (OBSL) is a 3.2-acre landfill located directly east of the facility processing plant and approximately 20 feet south of WL-3, at its west end. This unit is situated between two railroad spurs in a former channel of a small, northward flowing tributary of Red Lion Creek.

From 1970 to 1979, the OBSL received approximately 32,000 cubic yards of wastes that consisted of mercury-laden brine sludges. These wastes resulted from the removal of inorganic impurities during electrolysis of the salt brine solution. The unit was closed and capped in 1979. In 1983, an EPA evaluation determined that no actions were required at the unit under CERCLA.

New Brine Sludge Landfill

The New Brine Sludge Landfill (NBSL) is located south of the OBSL. It is separated from the OBSL by a railroad berm and roadway. This unit is a closed RCRA unit, consisting of two landfill cells, which cover-a-combined area of approximately 4 acres with an average depth of 8 feet. Cells 1 and 2 are separated and completely contained by synthetic liners.

The wastes were similar to those disposed of in the OBSL, which consisted of mercury brine sludges resulting from the removal of inorganic impurities during electrolysis of the salt brine solution. The NBSL received waste from 1979 to 1988. An engineered RCRA-type cap was completed for this SWMU in 1992.

Review of Aerial Photographs

A review of four aerial photographs from 1937, circa 1960, 1976, and 1985 provides a chronology showing the facility site prior to construction through the operation and then closure of many of the SWMUs. A summary of each photograph is provided below.

- 1937 At this time, the site is occupied by a farm with cultivated fields. Tide gates are present at the confluence of Red Lion Creek and the Delaware River and appear functional. There is open water at all the future SWMU locations except the Chemfix Test Unit and the NBSL. There is a tributary stream to Red Lion Creek in the present location of the NBSL. This tributary flows into an arm of Red Lion Creek that is located in the region of the OBSL and WL-3. The locations of WL-1 and WL-2 are part of Red Lion Creek. There is a sand bar between WL-1 and WL-2.
- circa 1960 The farm is still in existence; however, much of the open water occupying the future SWMU locations, approximately 75 acres, is filled with dredge spoils. The dredge spoil areas are covered with vegetation and are separated from Red Lion Creek by a series of dikes and access roads. A sand bar present in the previous photograph is more pronounced. The Tidewater Refinery, now Motiva, can be seen to the south of the Site.
- 1976 The OxyChem Facility is present at this time. WL-1, WL-2, WL-3, the OBSL, and the Chemfix Test Unit are all in operation. The Former Storm Drainage Pond is also present. The white areas in WL-2 may be waste PVC solids that were discharged in the early 1970s. The extent of Red Lion Creek remains essentially unchanged from the previous photograph. The sand bar present in the previous photographs-appears to have been buried by more sediment.
- 1985 All SWMUs present in the previous photograph, WL-1, WL-2, WL-3, the OBSL, and the Chemfix Test Unit, are all closed at this time. The NBSL is present and has one closed cell (Cell 1) and one active cell (Cell 2). The Motiva land farm is present just south of the NBSL. This facility was not present in the previous

photograph. Red Lion Creek appears darker than it did in the previous photograph, which indicates the creek is deeper. At this time, the tide gate (seen in the upper right corner of the photograph) appears to be washed-out and Red Lion Creek was receiving water from the Delaware River.

The dike was repaired in 1987. Since that time Red Lion Creek has not been subject to tidal influences. The tide gate serves to let water flow from Red Lion Creek to the Delaware River, but does not allow river water to enter the creek.

3.0 <u>CURRENT SURROUNDING LAND USE</u>

3.1 LAND USE

The facility is located in a heavily industrial area north of the intersection of Delaware Routes 72 and 9 (Clark's Corner Road and River Road). Several other industrial plants to the south and southwest adjoin the facility property. Keneka of Delaware, Inc., which operates the PVC plant, is located to the immediate South, and Metachem is located to the west. Two commercial packaging and transport companies, Chloromone and Oriole Chemical Carrier, lie on the immediate northern boundary of the facility. These companies handle chlorine and caustic products produced at the Delaware City Plant. Motiva operates a large oil and petrochemical refinery south of the facility. It owns a dredge material storage area east and south of OxyChem's Plant, a landfill, and land treatment are and two flyash disposal impoundments. A "landfarm" area east of OxyChem's disposal impoundments is part of the Motiva property.

Outside of the industrial portion lies agricultural and wetlands areas. The nearest residential area is over 1.5 miles northwest of the facility. It has been estimated that there are 2,000 people within a four-mile radius of the plant due mainly to the presence of local industry. There is an extensive band of open space used as a wildlife refuge along the Chesapeake and Delaware Canal 3 miles south of the facility. There are also dredge spoil areas along the canal and Delaware River, which are owned and maintained by the U.S. Army Corps of Engineers. A land use map for the area around the facility is presented in Figure 3.

3.2 ERIIS DATABASE SEARCH

Environmental Risk Information and Imaging Services (ERIIS) was contracted to conduct a search of federal and state environmental databases based on the address of the Site. The database searches were completed to assist in the identification of conditions at the Site and within a radius distance specified in ASTM Standard E1527-97. The following databases were searched with the findings as noted:

3.2.1 FEDERAL DATABASES

 National Priority List (NPL) - The NPL is a United States Environmental Protection Agency (USEPA) listing of the nation's worst uncontrolled or abandoned hazardous waste sites. NPL Sites are targeted for possible long-term remedial action under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980. In addition, the NPL Report includes information concerning cleanup agreements between the USEPA and potentially responsible parties, any liens filed against contaminated properties, as well as the past and current USEPA budget expenditures tracked within the Superfund Consolidated Accomplishments Plan (SCAP).

FINDING: The Site was not reported to be on the NPL. Two sites Metachem, a manufacturer of chlorinated solvents, and Tybouts Comer Landfill, a former municipal solid waste landfill are located within a one-mile radius of the Site were reported to be on the NPL. These sites are located, upstream along Red Lion Creek. These sites are known to have released contaminants into Red Lion Creek upstream from the OxyChem property. Metachem had releases of chlorinated benzenes in 1981 and 1986. They flowed onto the ground surface and into an unnamed tributary, which discharges to Red Lion Creek. Tybouts Corner Landfill is located near the headwaters of Red Lion Creek. A Remedial Investigation conducted in 1984 showed the landfill was releasing VOC constituents to Red Lion Creek.

2. Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) - The CERCLIS List is a comprehensive listing of known or suspected uncontrolled or abandoned hazardous waste sites. These sites have either been investigated or are currently under investigation by the USEPA for the release or threatened release of hazardous substances. Once a site is placed in CERCLIS, it may be subjected to several levels of review and evaluation and may ultimately be placed on the NPL. In addition to site events and milestone dates, the CERCLIS List contains financial information from the SCAP. As of February 1995, CERCLIS sites designated "No Further Remedial Action Planned" have been removed from the CERCLIS List.

FINDING: The Site was not reported to be on the CERCLIS List. No sites within a half-mile radius of the Site were reported to be on the CERCLIS List.

3. No Further Remedial Action Planned (NFRAP) Sites Report - The NFRAP Sites Report, also known as the CERCLIS Archive, contains information pertaining to sites which have been removed from the USEPA's CERCLIS Database. NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require federal Superfund action or NPL consideration.

FINDING: The Site was not reported to be listed in the NFRAP Sites Report. No sites within a half-mile radius of the Site were reported to be listed in the NFRAP Sites Report

4. Resource Conservation and Recovery Information System - Non-Corrective Action Treatment, Storage and Disposal (TSDs) Facilities (RCRIS-TS) Report - The RCRIS-TS Report contains information regarding those facilities that either treat, store or dispose of USEPA regulated hazardous waste. The following information also is included in the RCRIS-TS Report: information regarding the status of facilities tracked by the Resource Conservation and Recovery Act (RCRA) Administrative Action Tracking System (RAATS); inspections and evaluations conducted by Federal and State Agencies; all reported facility violations, the environmental statutes violated and any proposed and actual penalties; and a complete listing of USEPA regulated hazardous wastes which are generated or stored on-site.

FINDING: The Site was not reported to be listed in the RCRIS-TS Report. No sites within a half-mile radius of the Site were reported to be listed in the RCRIS-TS Report.

5. Resource Conservation and Recovery Information System - TSDs Subject to Corrective Action (RCRIS-CA) Report - The RCRIS-CA Report contains-information pertaining to hazardous waste TSD facilities which have conducted, or are currently conducting corrective actions as regulated by the Resource Conservation and Recovery Act. The following information also is included in the RCRIS-CA Report: information regarding the status of facilities tracked by the RAATS; inspections and evaluations conducted by Federal and State Agencies; all reported facility violations, the environmental statutes violated and any proposed

and actual penalties; information pertaining to corrective actions undertaken by the facility or the USEPA; and a complete listing of USEPA regulated hazardous wastes which are generated or stored on-site.

FINDING: The Site was not reported to be listed in the RCRIS-CA Report. No sites within a one-mile radius of the Site were reported to be listed in the RCRIS-CA Report.

6. Resource Conservation and Recovery Information System - Large Quantity Generators (RCRIS-LG) Report - The RCRIS-LG Report contains information regarding facilities that either generate more than 1,000 kilograms (kg) of USEPA regulated hazardous waste per month or meet other applicable requirements of RCRA. The following information also is included in the RCRIS-LG Report: information regarding the status of facilities tracked by the RAATS; inspections and evaluations conducted by Federal and State Agencies; all reported facility violations, the environmental statutes violated and any proposed and actual penalties; information pertaining to corrective actions undertaken by the facility or the USEPA; and a complete listing of USEPA regulated hazardous wastes which are generated or stored on-site.

FINDING: The Site was not reported to be listed in the RCRIS-LG Report. No sites within a quarter-mile radius of the Site were reported to be listed in the RCRIS-LG Report.

7. Resource Conservation and Recovery Information System - Small Quantity Generators (RCRIS-SG) Report - The RCRIS-SG Report contains information regarding facilities that either generate between 100 kg and 1,000 kg of USEPA regulated hazardous waste per month or meet other applicable requirements of RCRA. The following information also is included in the RCRIS-SG Report: information regarding the status of facilities tracked by the RAATS; inspections and evaluations conducted by Federal and State Agencies; all reported facility violations, the environmental statutes violated and any proposed and actual penalties; information pertaining to corrective actions undertaken by the facility or the USEPA; and a complete listing of USEPA regulated hazardous wastes which are generated or stored on-site.

FINDING: The Site was not reported to be listed in the RCRIS-SG Report. No adjacent sites were reported to be listed in the RCRIS-SG Report. No sites within a quarter-mile radius of the Site was reported to be listed in the RCRIS-SG Report.

8. Emergency Response Notification System - ERNS is a national computer database system that is used to store information on the sudden and/or accidental release of hazardous substances, including petroleum, into the environment. The ERNS reporting system contains preliminary information on specific releases, including the spill location, the substance released and the responsible party. The information in the ERNS Report pertains only to those releases that occurred between January 1, 1997 and June 11, 1997.

FINDING: The Site was listed in the ERNS. An oil spill (non-PCB) occurred on March 7, 1998 in a cement containment area. The area of impact was 30 feet by 100 feet.

 Toxic Release Inventory (TRI) System of 1994 - The 1994 TRI Report contains information on the industrial release and/or transfer of toxic chemicals as reportable under Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA Title III).

FINDING: The Site was in the 1994 TRI Report due to transfers and releases of chlorine, mercury, carbon tetrachloride, sulfuric acid, hydrochloric acid, sodium hydroxide, and sodium sulfate. The following adjacent sites were also reported to be listed in the 1994 TRI Report:

Facility	Address	Substance Released/Transferred
Chloromone	1645 River Road	chlorine, sulfuric acid
Georgia Gulf Corporation	1685 River Road	vinyl chloride, hydrochloric acid, chromium compounds, ammonia, antimony compounds, di(2-ethylhexyl)phthalate, methanol, sodium hydroxide
Metachem	Governor Lea Road	ethylene glycol, hydrochloric acid, chlorine, 1,2-dichlorobenzene, 1,2,4-trichlorobenzene, 1,3-dichloro- benzene, 1,4-dichlorobenzene, chlorobenzene, benzene, sodium hydroxide

Civil Enforcement Docket - Docket is the USEPA's System for tracking judicial
cases filed on the USEPA's behalf by the Department of Justice. The Docket Report
contains information on cases from 1972 to the present.

FINDING: The Site was not reported to be listed in the Docket Report. Two sites within a one-mile radius of the Site were reported to be listed in the Docket Report. Metachem located on Governor Lea Road was reported for a violation of CWA 311. The date concluded was reported to be May 20, 1987, with a penalty of \$37,500.

Tybouts Corner Landfill located US Route 13 and Delaware Route 71 was reported for a violation of the following:

Law Violated	Date Concluded	Penalty
CERCLA 106 CERCLA 104E3 CERCLA 107 RCRA 7003 CERCLA 104E7B	12/21/88	\$0 (Consent decree with cost recovery)
CERCLA 106 CERCLA 104A CERCLA 107 RCRA 7003	12/21/88	\$0 (Case combined with another case)
CERCLA 106A CERCLA 107A	4/12/90	\$0 (Consent decree with cost recovery)
CERCLA 106A CERCLA 107A RCRA 7003	10/7/91	\$0 (Consent decree with cost recovery)

3.2.2 <u>STATE DATABASES</u>

1. Delaware Hazardous Substance Release Sites - The Delaware Hazardous Substance Release Sites contains information concerning sites that are deemed potentially hazardous by the Delaware Department of Natural Resources and Environmental Control.

FINDING: The Site was not reported to be on the Delaware Hazardous Substance Release Sites. One adjacent site, Metachem, was reported to be listed Delaware Hazardous Substance Release Sites due to its presence on the NPL.

2. Delaware Underground Storage Tank (UST) Report - The Delaware UST Report is a comprehensive listing of all registered active and inactive USTs and ASTs located within the State of Delaware.

FINDING: The Site was not reported to be listed in the Delaware UST Report. No sites within a quarter-mile radius of the Site were reported to be listed in the Delaware UST Report.

3. Delaware Leaking Underground Storage Tank Report - The Delaware Leaking Underground Storage Tank Report is a comprehensive listing of all reported active and inactive leaking underground storage tanks located within the State of Delaware.

FINDING: The Site was not reported to be on the Delaware Leaking Underground Storage Tank Report. The following sites within a half-mile radius of the Site were reported to be on the Pennsylvania List of Confirmed Releases:

<u>Facility</u>	Address	Substance
Commonwealth Trust Co.	Rt. 13 & Hamburg Rd.	Gas/Diesel
Buena Vista Gulf	616 S. Dupont Hwy	Gasoline
Operating Engineers JATC	925 Red Lion Road	Gas/Diesel
Vern's Auto Repair	1007 Red Lion Road	Gasoline
Metachem	745 Governor Lea Road	Heating Oil
Metachem	745 Governor Lea Road	Diesel

4. Delaware Solid Waste Landfill Facilities- The Delaware Solid Waste Facilities (SWF) List contains summary information pertaining to all permitted solid waste landfills and transfer stations operating within the State of Delaware.

FINDING: The Site was not reported to be on the list of Delaware Solid Waste Landfills. No sites within a one-half mile radius of the Site were reported on this list.

4.0 POPULATION INFORMATION

Demographic information available from the U.S. Bureau of the Census has also been reviewed to characterize the resident population. Demographic data were used to identify the size and age of the locality's population, and were useful in identifying potentially sensitive populations living in the vicinity of the facility. In the immediate vicinity of the facility, the dominant land use is industrial/commercial. Rural areas lie beyond the industrial facilities, and land use in these areas is primarily agricultural. The nearest residential area is over 1.5 miles from the facility. Census figures presented below are for Tracts 164 and 165 in New Castle County. Tract 164 is bounded by Red Lion Creek, the Delaware River, the Chesapeake and Delaware Canal and Delaware Route 71. Tract 165 consists of Delaware City and small areas to the north and southwest. These data are presented to describe the rural population surrounding the facility, as well as the nearby urban population of Delaware City.

Data from the 1990 Census indicated a total of 2,456 people residing in Tract 164 and 1,682 residing in Tract 165. The 1990 Census report characterizes Tract 164 as rural (98.4%) with a predominantly white population that is relatively young. Approximately 75 percent of the population of Tract 164 and 70 percent of the population of Tract 165 are less than 45 years of age. Table 1 provides the 1990 population of Tracts 164 and 165 by age distribution.

Population projections do not exist for Tracts 164 and 165. The population for New Castle County from the 1990 census was 443,580. The population was inspected to increase 9.7 percent to 486,546 by the year 2000 and 8.7 percent to 529,008 by the year 2020.

5.0 WATER USE

The OxyChem plant receives its process and drinking water from the Wilmington Suburban Water Company. It does not use site surface water or groundwater for any purpose. The major source of water in the vicinity of the site is groundwater derived from the Potomac Aquifers.

5.1 POTENTIAL GROUNDWATER SOURCES

The Site is underlain by four main unconsolidated aquifers: (1) the Columbia Formation water table aquifer, and (2) three confined aquifers within the Potomac Formation. From youngest to oldest (top down), the three Potomac Formation Aquifers are the Upper, Middle, and Lower Hydrologic Zones. Intervening clays of the Potomac Formation along with the Merchantville Formation between the Columbia and Potomac Upper Hydrologic Zone (UHZ) serve as a confining unit.

The majority of the subsurface investigation work at the Site has focused on the Columbia Formation. The primary reason for this focus is that the Columbia Formation directly underlies the Site and would be the first subsurface zone to be impacted by chemicals. This is also the case at the surrounding industrial sites. Typically, the natural quality of the Columbia Formation is often poor (e.g., color, odor, turbidity). Although the Columbia Formation yields good amounts of water, the confined Potomac Aquifers are capable of producing greater quantities. For these reasons, groundwater supplies in the area are typically derived from the lower confined Potomac Aquifers. A thick unit of low-permeability clay exists between the Columbia Formation and the Potomac UHZ. This low-permeability clay provides an impermeable barrier to the downward vertical migration of water from the Columbia Formation to the Potomac UHZ.

5.2 GROUNDWATER USAGE

A well inventory was conducted to identify wells completed in the Columbia and Potomac Aquifers. This well inventory included an evaluation of DNREC and DRBC records and a review of previous nearby industrial investigations. Large volume withdrawals (> 100,000 gallons per day) were evaluated from 1995 DNREC and DRBC records.

5.2.1 <u>COLUMBIA FORMATION</u>

Five residential wells have been identified that tap the Columbia Aquifer within three miles of the facility (ERM's Draft Background Data Review Report, September 15, 1989). These wells serve approximately 19 people. However each of these wells is located north of Red Lion Creek, which acts as a hydrogeologic barrier to preclude any potential impacts to these wells from the OxyChem site. Hydraulically upgradient of the Delaware City facility, Motiva, and Metachem operate recovery wells in the Columbia Formation as part of ongoing remediation systems. Motiva has three recovery wells that pump a total of 120 gallons per minute (gpm) and Metachem as four 30 gpm recovery wells. These wells are used for the non-contact remediation of contaminated groundwater only. In addition, they do not influence the flow of groundwater in the Columbia Formation at OxyChem's facility.

5.2.2 POTOMAC FORMATION

Figure 4 shows the location of the large volume groundwater withdrawals from the Potomac Aquifers in the vicinity of the Site. Table 4 provides a list of the large volume groundwater withdrawals from the Potomac Aquifers in the vicinity of the Site. Both Figure 4 and Table 2 are based on actual 1995 DRBC withdrawal records, not permitted water allocations that may overestimate or underestimate actual usage. In addition, Potomac Formation hydrologic zone breakdowns for these withdrawals are also provided.

In the vicinity of the site, the majority of potable, industrial, commercial, and agricultural water use is derived from the Potomac Aquifers. The majority of withdrawals are from the middle hydrologic zone (MHZ) and lower hydrologic zone (LHZ) of the Potomac Formation. Wells tapping the deeper MHZ and LHZ have an even less chance of being impacted by the Columbia Aquifer than the UHZ due to intervening impermeable clays that separate these zones.

The major users of groundwater from the Potomac Aquifers in the region are: Motiva Refinery located immediately south of the plant; Delaware City, located approximately three miles southeast of the plant; and, several water companies located north and west of the plant. The largest of these water companies is the Artesian Water Company.

The only production wells located in the Potomac Formation Aquifers within three miles of the Site are used by Motiva and Artesian Water Company. The nearest production well on the Motiva property is approximately 4,620 feet away and taps the LHZ of the Potomac. The second nearest well on the Star property is approximately 1.1 miles away and taps the MHZ. The nearest Star production well tapping the UHZ is approximately 3 miles south of the Site. All Star production wells are used for non-contact industrial purposes only. The nearest Artesian Water Company drinking water supply well is one mile northeast of the Site.

5.3 POTENTIAL SURFACE WATER SOURCES AND USERS

Chloride concentrations in excess of 250 mg/l preclude the use of Delaware River water as a drinking water supply. The only known user of surface water within three miles of the OxyChem site is Star, which treats Delaware River water for non-contact industrial purposes. Star has also pumped water from Red Lion Creek.

Red Lion Creek and the Delaware River are secondary and primary recreation waters, respectively. The Delaware River is also a navigable body of water used for transportation.

6.0 PROJECTED FUTURE USE

The projected future use of the Plant and large area surrounding the plant is for industrial purposes. The Delaware City, Delaware Plant has been in operation since it was built in 1965 and is likely to remain an industrial facility. The Site is located in the middle of a large area consisting of heavy industry and commercial facilities to support the industry (e.g., transportation). Furthermore, the long time use of the Plant and surrounding area for heavy industry has led to a state of almost ubiquitous soil and shallow groundwater contamination. For these reasons, the concept of a residential area supplanting this heavy industrial area is not practical in the near or long term. In order for a residential area to supplant the present heavy industrial area, all or most of the sites would have to be remediated to residential standards. This conclusion is consistent with EPA policy, which recognizes that RCRA facilities typically are industrial properties that are actively managed. EPA states the following example in the OSWER Directive No. 9355.7-04: "Future industrial land use is likely to be a reasonable assumption where a site is currently used for industrial purposes, is located in an area where the surroundings are zoned for industrial use, and the comprehensive plan predicts the site will continue to be used for industrial purposes."

At this time, OxyChem plans to continue operation of the plant for the purpose of manufacturing chlorine into the foreseeable future. With regard to site-specific environmental issues, OxyChem plans to implement appropriate deed restrictions, engineering controls, and institutional controls, as required. Furthermore, the site may be divided into subsections allowing for various degrees of remediation. For example, deed restrictions and institutional controls may allow the manufacturing area to remain industrial.

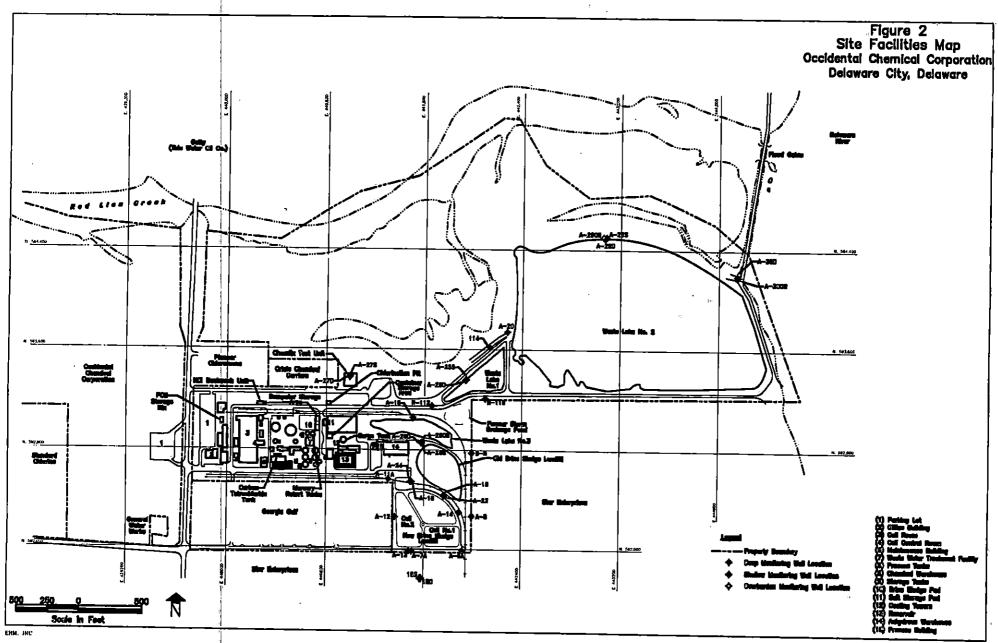
Current groundwater usage in the surrounding area is also likely to continue. The Potomac Aquifers will be used as the major source of water. Use of the Columbia Aquifer for residential water supplies may continue. Presently all residential users of the Col aquifers are located north of Red Lion Creek, which acts as a hydrogeologic barrier to preclude any potential impacts to these wells from the OxyChem site. Future residential development in the area, if any, would likely be served by a public water

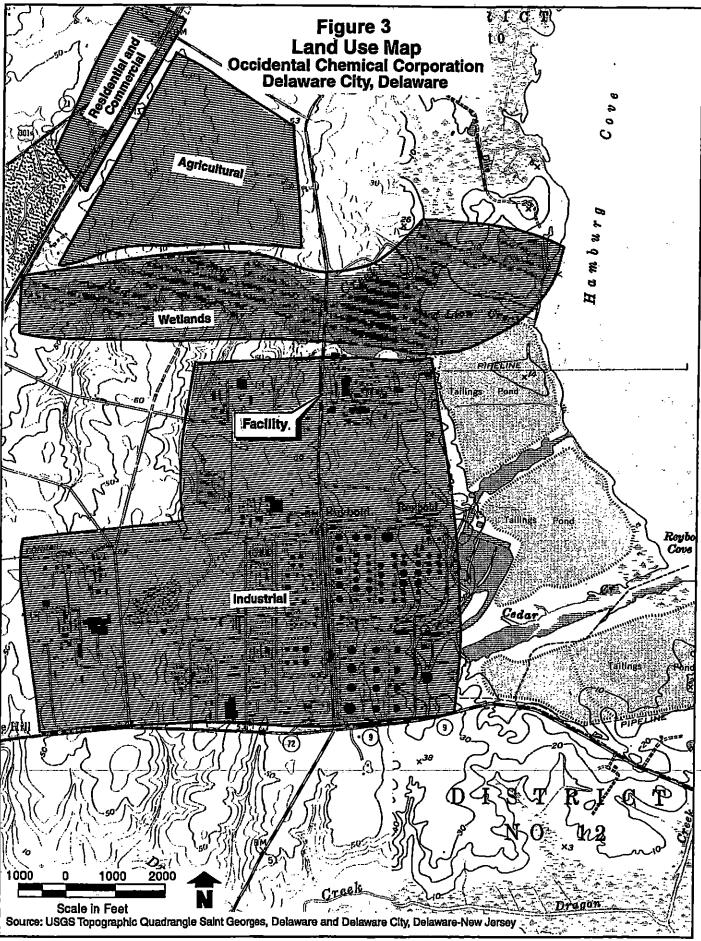
system deriving its water from the Potomac Aquifers or transmitted from another distant source via a pipeline. Pumping of the Columbia Aquifer to the south and west by Motiva and Metachem for remediation purposes does not influence groundwater at the OxyChem site. Therefore any residential development in these directions also would not. Continued pumping of the Columbia Formation by these facilities is not expected to influence the groundwater flow in the Columbia Formation at the OxyChem site, which is to the north with discharge to Red Lion Creek.

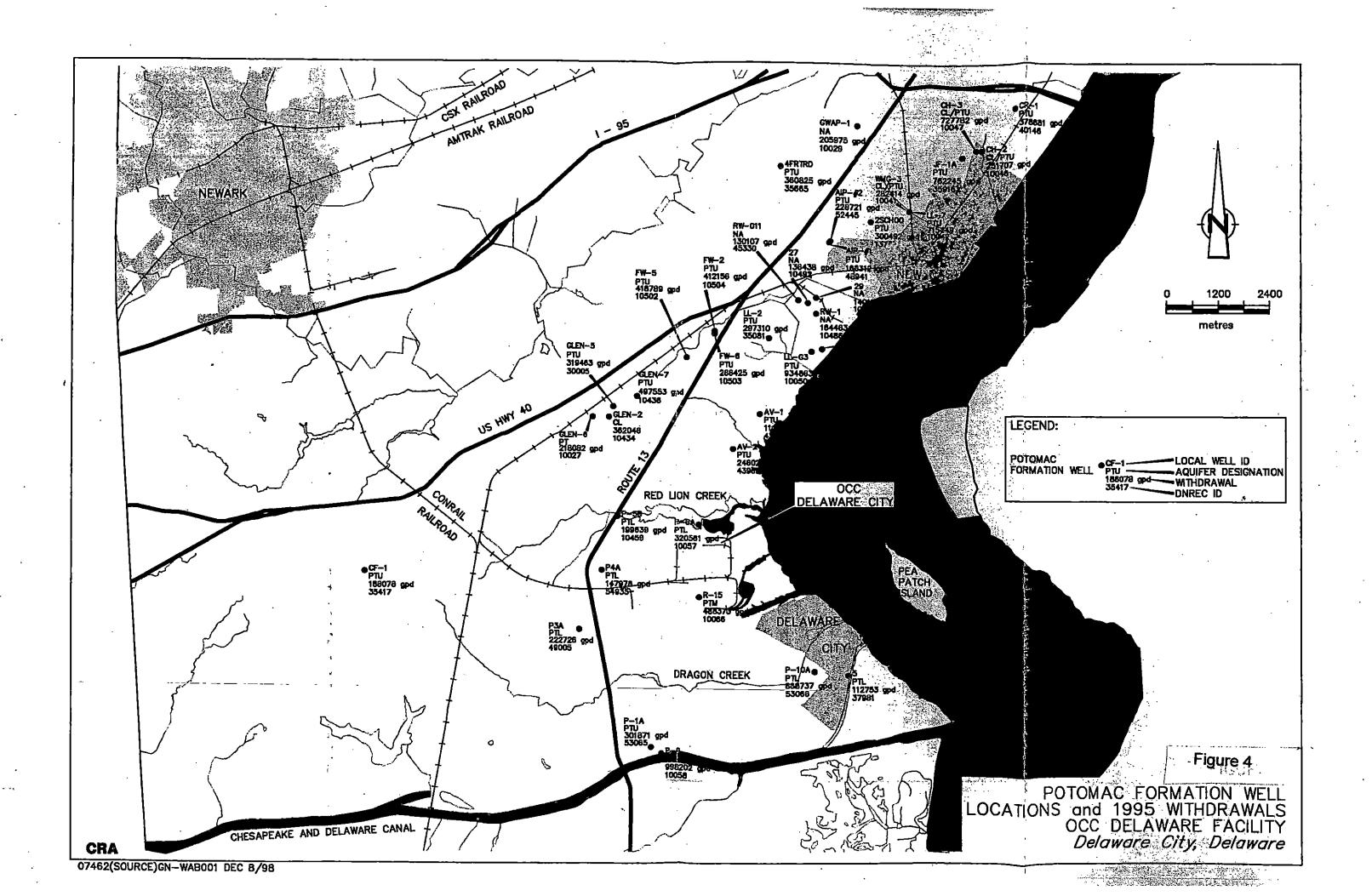
7.0 <u>CONCLUSIONS</u>

Based on the information presented in this justification document, OxyChem concludes that a non-residential use scenario is appropriate for site soils and groundwater. Part 1 of the Phase III risk assessment will be a pathway analysis for on-site areas of the facility. Under a Corrective Action program, exposure points along each pathway will be eliminated through institutional or engineering controls. As a component of this analysis, OxyChem will assume a non-residential use scenario for site soils and groundwater.

FIGURES







TABLES

TABLE 1

1990 POPULATION OF TRACTS 164 AND 165 BY AGE DISTRIBUTION

	Tract	Tract	
Age	164	165	
<1	27	12	
1-2	56	50	
3-4	93	48	
5	21	3	
6	54	17	
7-9	72	47	
10-11	87	90	
12-13	108	55	
14	35	34	
15	32	20	
16	22	40	
17	66	26	
18	34	39	
19	. 0	21	
20	76	18	
21	40	1 1	
22-24	49	83	
25-29	245	156	
30-34	245	111	
35-39	207	144	
40-44	274	150	
45-49	168	93	
50-54	54	85	
55-59	79	86	
60-61	37	23	
62-64	48	33	
65-69	77	41	
70-74	39	49	
75-79	54	53	
80-84	48	41	
85 and over		13	

TABLE 2 DNREC WATER USE DATA - 1995

	}	1					Average
					1	·	Daily
	i	1				Amual Total	Withdrawal
Owner	DNREC ID	LOCAL ID	Longitude	Latitude	Aquifer	1,000s GPM	GPD
ARTESIAN	010027	GLEN 6	753936	393735	PT	79,600.0	218,08
ARTESIAN	010029	GWAP1	753522	394116	NA	75,181.0	205,97
ARTESIAN	010041	WMG3	753430	394013	CL/PTU	103,081.0	282,41
ARTESIAN	010046	CH 2	753322	394058	CL/PTU	91,873.2	251.70
ARTESIAN	010047	CH3	753327	394058	CL/PTU	265,640.5	727,78
ARTESIAN	010049	LL7	753430	394013	PTU	261,139.0	715,44
ARTESIAN	010050	LL C3	753604	393826	PTU	341,225.0	934,86
ARTESIAN	010052	LL K1	753554	393828	CL/PTU	90,128.0	246,92
ARTESIAN	010434	GLEN 2	753920	393735	CL	132,146.9	362,04
ARTESIAN	010436	GLEN 7	753853	393751	PTU	181,606.8	497,55
ARTESIAN	010502	FW 5	753805	393821	PTU	152,858.0	418,78
ARTESIAN	010503	FW 6	753738	393839	PTU	97,245.0	266,42
ARTESIAN	010504	FW 2	753738	393841	PTU	150 <i>A</i> 37.0	412,15
ARTESIAN	030005	GLEN 5	753916	393743	PTU	116,604.0	319,46
ARTESIAN	035081	LL 2	753645	393836	PTU	108,518.0	297,31
ARTESIAN '	035417	CF1	754316	393536	PTU	68,648.3	188,07
ARTESIAN	035916	JF 1A	753340	394053	PTU	278,219.4	762,24
ARTESIAN	040146	CP 1	753250	394129	PTU	138,218.7	378,68
ARTESIAN	043068	FW4R	NA	NA	PTU	118,164.0	323,73
ARTESIAN	043962	AV1	753653	393738	PTU	419,239.0	1,148,600
ARTESIAN	043963	AV2	753719	393711	PTU	89,798.4	246,02
ARTESIAN	048941	AIP #1	753548	393949	PTU	61,434.0	168,317
ARTESIAN	052445	AIP#2	753547	393950	PTU	83,483.0	228,721
DELAWARE CITY	037981	5	753527	393419	PTL	41,155.0	112,753
NEW CASTLE BWL	000137	2SCHOO	753508	394005	PTU	109,679.4	300,492
NEW CASTLE BWL	035665	4FRTRD	753635	394045	PTU	131,701.0	360,825
NEW CASTLE COUN	010486	RW1	753600	393855	NA	60,029.0	164,463
NEW CASTLE COUN	010492	27	753608	393903	NA	49,800.0	136,438
NEW CASTLE COUN	010494	29	753600	393907	NA	51,146.0	140,126
NEW CASTLE COUN	045330	RW-011	753617	393905	NA	47,489.0	130,107
STAR ENTERPRISE	010057	P-6A	753752	393613	PTL	117,004.6	320,561
STAR ENTERPRISE	010058	P-9	753827	393320	PTL.	364,343.6	998,202
STAR ENTERPRISE	010066	R-15	753751	393518	PTM	178,256.1	488,373
STAR ENTERPRISE	010459	P-5B	753911	393619	PTL	72,868.4	199,639
STAR ENTERPRISE	049005	РЗА	753948	393453	PTL	81,295.0	222,726
STAR ENTERPRISE	053065	P-1A	753837	393325	PTU	110,182.9	301,871
STAR ENTERPRISE	053066	P-10A	753559	393422	PTL	317,089.1	868,737
STAR ENTERPRISE	054935	P4A	753926	393538	PIL	54,012.1	147,978

CL-COLUMBIA

PT - POTOMAC

PTU - POTOMAC UPPER

PTM - POTOMAC MIDDLE

PTL - POTOMAC LOWER

NA-NOT AVAILABLE

APPENDIX G

INVESTIGATION PROGRAM

APPENDIX G INVESTIGATION PROGRAM FIELD PROCEDURES

This appendix provides details regarding the field procedures used during the Phase II investigation program. The work was conducted in accordance with the Scope of Work for the Phase II field activities, the Quality Assurance Project Plan (QAPP), the Data Management Plan, the Health and Safety Plan HASP), and the Community Relations Plan provided in the Phase II Work Plan.

G.1 GROUNDWATER MEASUREMENTS

Water level measurements were collected synoptically at both high and low tide periods. Teams of two to three people were used to collect the measurements in as short a timeframe as possible. An electronic depth to water meter was used to obtain the water level measurements. All electronic water level recorders were standardized at the start of each event. In addition, optical interface probes were used to detect the presence of NAPL in wells with the potential to be in proximity to NAPL, primarily Waste Lakes 1 and 2. Note that water level measurements were also collected prior to and during groundwater sampling at each well.

G.2 DRILLING AND SUBSURFACE INVESTIGATION METHODS

G.2.1 WELL INSTALLATION

Phase II monitoring wells were installed using the hollow stem auger method. Split-spoon samples were collected continuously and visually logged. A PID was used to monitor the well boring headspace and spoon samples. Solid and aqueous cuttings were drummed and staged onsite prior to proper offsite disposal.

Monitoring wells were installed utilizing 6-5/8-inch I.D. hollow stem augers. A plug was used at the base of the augers during drilling to prevent running sands from entering the augers, thus allowing proper installation of the well screen and riser. Each monitoring well was installed with 4-inch-diameter, 0.010 slot, PVC screen; the typical screen length was 10 feet. An appropriate length of 4-inch diameter, schedule 40, flush coupling PVC casing was inserted to extend from the top of the screen interval to the

ground surface. No glue was used in joining screen and casing sections to preclude the potential for analytical interference.

A graded sand pack was placed in the annulus around the well screen to a height of approximately 2 feet above the screened interval. A 2-foot thick bentonite seal was placed above the sand pack and the remainder of the annular space was filled with a cement/bentonite grout. Each well was completed by cementing in place a cast-iron standpipe with a locking cap. The cement was mounded slightly around the stand-pipe so as to promote stormwater drainage away from the well.

Following monitoring well installation, all new wells were developed. The objective of well development was to remove sediments from the bottom of the well and screen interval. Development of wells was accomplished by using a surge and bail/pump technique. Each new well was developed until the purge waters reach turbidity readings of 5 NTUs. Purge water resulting from well development was contained on site pending analysis prior to offsite disposal.

Upon completion of all monitoring wells, each deep monitoring well was geophysically logged using a gamma logging tool.

G.2.2 <u>STREAM PIEZOMETER INSTALLATION</u>

The stream piezometers (also known as well points) are 1-inch diameter PVC tubes approximately 5 feet in length with a 4-foot section of perforation. They were installed to a maximum depth of 10 feet in the sediments beneath the creek. An air percussion hammer was used to install the piezometers. A Delaware licensed surveyor surveyed all piezometers as to location and elevation of top of casing.

G.3 <u>SAMPLING PROCEDURES</u>

The numbers of samples, locations, and rationale for each sample media to be collected are presented in Section 2.2 of this Report. Please refer to Section 2.2 for this information. Procedures associated with the surface soil, subsurface soil, surface water, sediment and ground water sampling are described in this section.

G.3.1 SURFACE SOIL SAMPLING

Surface soil samples to a depth of 12 inches and sediment samples at the surface from the drainage channels were collected using a hand-driven bucket auger or a stainless steel trowel. The soil samples were removed from the bucket auger using a pre-cleaned stainless steel scoop or spoon. Soil samples collected using the bucket auger or stainless steel trowels were placed directly into the sample container by tightly packing the sample into the container to minimize headspace. Appropriately sized volumes were transferred to a one-liter laboratory-cleaned glass jar, and the geologist logged a visual description of the soil.

G.3.2 SUBSURFACE SOIL SAMPLING

Subsurface soil samples (greater than 1 foot in depth) were collected during the boring program with a soil drill rig. Samples were split into appropriate containers for field screening and chemical laboratory analysis. The soil samples for laboratory analysis were procured from the split-barrel using a stainless steel spatula. The samples for VOC analysis were placed immediately into 4-ounce laboratory-cleaned glass jars and packed to minimize headspace. All cuttings were drummed and staged onsite pending disposal characterization and offsite disposal. Each boring was grouted with a bentonite slurry grout.

G.3.3 GROUND WATER SAMPLING

Prior to sample acquisition, each monitoring well was evaluated using an interface probe at both the top and bottom of the water column to determine if a non-aqueous phase is present. Following the interface evaluation, depth-to-water measurements were made and recorded to 0.01 feet.

Ground water sampling and purging using low flow pumps was performed in accordance with the Ground Water Sampling Standard Operating Procedures found as Attachment 1 of the Phase II Work Plan. Ground water samples collected for dissolved metals analysis were field filtered through a 0.45 m pore size filter prior to preservation to allow determination of dissolved metals. The samples were filtered directly into the sample container with necessary preservation already added.

Field measurements for pH, specific conductance, and temperature were obtained on ground water samples immediately following sample collection. Grab samples collected in a beaker were used to obtain these measurements. All measurement probes were rinsed with distilled water between samples.

G.3.4 MARSH SEDIMENT CORING

EPA's June 19, 1998 approval letter for the Phase II RFI Work Plan included a request for information on how sediment core sample integrity will be maintained during collection of sediment samples for VOC analyses (Comment No. 16). The sample collection methodology was provided to EPA in a letter dated December 16, 1998, and is summarized below.

In order to minimize sample disturbance and maintain the integrity of the sample for chemical analyses, two aluminum cores were collected at each location. The first core was retrieved and split longitudinally. The core was logged and screened with a PID and Sudan IV dye. The second core was then cut open and samples for chemical analysis were collected from the interval exhibiting the highest PID response and/or response to the dye from the first core. At one point prior to the sampling, it was agreed to collect the sample from the second core by cutting a section of core with a core cutter, capping both ends of the sample, and sending it to the lab. This methodology was not used after it was determined that the laboratory would have to cut open the core and place the sample in the lab bottles prior to analysis. Furthermore, there was the risk that not enough sample volume would be sent from the field to the lab using this methodology.

G.3.5 SURFACE WATER SAMPLING

Surface water samples were collected by boat or, if impractical, a person wading to the sample location. The water samples were collected at mid-depth by immersing a laboratory-cleaned glass jar (using a sub-surface grab sampler sampling tool as necessary) below the surface of the water and transferring the water to the appropriate sample container(s). A separate clean glass jar was used as the sampling tool at each station to eliminate potential cross-contamination.

Field water quality parameters such as pH, dissolved oxygen, specific conductivity, and temperature were measured in-situ at each sampling station. A visual assessment of watercolor, and odor (total suspended solids were analyzed by the laboratory to provide an indication of turbidity) were made upon collection of all surface water samples.

A fluorescent painted plastic stake was placed along the stream bank at each station and labeled with the station number. A licensed surveyor determined the longitude and latitude of each sampling point.

G.3.6 <u>SEDIMENT SAMPLING</u>

Sediment samples were collected at locations corresponding to surface water sample location, as described above. The samples were collected using a boat, or if impractical, by a person wading to the sample location. Sediment samples were collected from the sediment bed surface to a maximum depth of 12 inches.

In shallow water, samples were collected using a thin-wall tube auger. If the water column above the sediments at the sample location is flowing or greater than 4 inches in depth, a thin-wall tube auger were used to collect the sample to minimize washing of the sediment as it was retrieved. Standing water from the top of the sampling tool was decanted off prior to withdrawing the sediment. In all cases, a decontaminated stainless steel trowel was used to transfer the sample into the stainless steel bowl or directly into the sample container.

Samples to be analyzed for VOCs were placed directly from the corer into the sample container by tightly packing the sample into the container to minimize headspace. For all other analyses, stream sediments were placed into a decontaminated stainless steel bowl, homogenized using a stainless steel trowel, then transferred into the appropriate sample containers. The samples were placed in laboratory-cleaned, appropriately labeled, bottles with Teflon lined septa, depending on the analysis to be performed.

A fluorescent painted plastic stake was placed along the stream bank at each station and labeled with the station number. A licensed surveyor determined the longitude and latitude of each sampling point.

G.3.7 STREAM PIEZOMETER SAMPLING

Stream piezometers were sampled using a peristaltic pump because of the limited water column present in the 1-inch diameter well points. The pump intake tube was carefully lowered into the well point to minimize disturbance of sediment. Due to the low yield of the piezometers, the samples had to be collected over several days. The first day one

volume was purged from each piezometer. On subsequent days one volume was collected from each piezometer, placed in the appropriate sample jar(s), and placed in a cooler. When an appropriate volume had been obtained for a given group of analytical parameters, the samples were submitted to the laboratory for analysis.

G-6

Figure 3-7 Quality Assurance Audit Form Occidental Chemical Corporation, Delaware City, Delaware Project: OxyChem-Delaware City WO Number: 7462 Date: As work was performed Auditor(s): Bryan Foulke On-Site Sampling Personnel: D. Tyrann, A. Williams, D. Steiner, J. Rabie, J. Raner, A. Kisiel Audit Conducted on the following: Surface Water/Sediment Soil Sampling Ground Water Decontamination Y = YesN = NoN/A = Not ApplicableN/D = Not DeterminedSample Collection: Do sampling locations agree with those specified in the Work Plan/Sampling Plan? Is the sampling location either documented sufficiently and marked to allow it to be found/sampled again in the future? Are sampling times, Traffic Report Numbers and sample Y/':N/A description noted in the FNB? Is sampling proceeding from the suspected least contaminated area to the most contaminated area? Have all field measurements been properly taken as per Sampling Plan? Are field measurement(s) being taken immediately after the sample is collected? ____Y___ Have sample bottles been labeled properly? ___Y___ Have proper containers and preservatives been used? Y Are proper sample volumes procured?X..... Does the potential for sample cross-contamination exist based on procedures observed? N Have MS and MSD(s) been collected as per QA/QC Plan? Y Does a travel blank exist for each matrix present? Y Are samples being refrigerated/iced immediately after collection? <u>Y</u> Has condition of sample been recorded in the FNB and in the trafficreport? Y Have legal seal(s) been properly filled out and attached to the shipping container(s)? <u>Y</u> R. J.

Figure 3-7 Quality Assurance Audit Form (continued) Occidental Chemical Corporation, Delaware City, Delaware

Soil Sampling (Check if not applicable): 1/13725726/99

Туре:	Hand: Auger or Rig-B	ackhoe Pit
	Are samples being collected at proper depths?	<u> </u>
	Are samples being screened with an OVA (if specified in Woapplicable)?	rk Plan and
	Is a description of soils/materials being logged?	<u> </u>
	Have soils been homogenized where applicable (Specified by Sampling Plan)?	y the <u>Y</u>
Surface Wat	er/Sediment Sampling (check if not applicable): 12	2/14-18/98
	Have stream flow and velocity parameters been noted?	<u>N/A</u>
	Estimated or Measured	
	Has sampling proceeded from downstream to upstream loca	tions? Y
	Has the sampler acquired the water sample upstream of his minimize suspended sediment from entering the sample?	position to YY
	Have water samples been collected in the mixing zone, not s areas?	tagnant Y
	Have sediments been characterized as to type and size distri	bution? Y
	Has the proper sediment fraction (fine, depth) been sampled analyses of interest?	for the
Ground Wat	ter Sampling (Check if not applicable): 12/1-4/98	
	Have organic vapor readings been obtained when the well hopened?	ead was
	Have depth to water level readings been taken for all wells?	<u> </u>
	Have the well specifications been noted properly (i.e., total of diameter, depth-to-water to the nearest one-hundredth of a	
	Has the purge volume been calculated properly?	<u>Y</u>
	Has well yield been properly evaluated to determine when sacquisition should take place (i.e., does well go dry and need	_
	Has the purge pump been placed at the proper level to ensu	re proper wellY

Figure 3-7 Quality Assurance Audit Form (continued)
Occidental Chemical Corporation, Delaware City, Delaware

	What evacuation met	hod has been used?		Submersiblė
	Bailer	Submersible	Other	
	Bladder Pump	Centrifugal Pump	Fultz Pump	**************
	If metals are being an	<u>Y</u>		
	Are field pH, conduct	tivity, and temperature b	peing measured and	
	documented?			Y
	Is there documenta	tion of calibrating the in	struments?	<u> </u>
	Are bailer bags mark	ed as to site name, well I	D, and date of dedication?	N/A
	Is bailer line and baile	er dedicated to each well	l and line disposed of after	
	use?			N/A
	Bailer Type	Line Typ	pe	N/A
	Have appropriate me	asures been taken to dis	pose of contaminated purge	
	water, pump lines, ba	ilers, etc.?		Y
		Has as much informatio		
		een obtained (i.e., depth	, casing type, diameter,	/-
•	treatment present, etc	•		N/A
	Has the sample been head as possible?	collected prior to treatm	ent and as close to the well	N/A
	Has the domestic well	ll been purged sufficient	ly to reach pH, conductivity,	
	and temperature stab	ilization?		N/A
	•	en removed from the do	mestic well before the	
	sample was taken?			N./A.
Decontamin	ation:			
	Has sampling equipm	nent been decontaminate	ed properly for the given	
	analytes as per QA P	lan?		У
	Have the proper deco	ontamination solutions b	een used?	Y
	For large equipment	(backhoes, drill rigs), ha	s decontamination taken	
	place in an appropria	te area?		Y
	-Has decontamination	water/solution-been-co	ollected for proper disposal?	<u> </u>

Where disposed? <u>transferred to on-site storage tank</u> for offsite disposal upon project completion

Figure 3-7 Quality Assurance Audit Form (continued) Occidental Chemical Corporation, Delaware City, Delaware

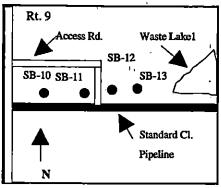
	Has disp and disp		nent, that is co	ntaminated, been p	roperly deconned	<u>Y</u>
	Have de Samplin	_	oeen taken fron	n the sampling equ	ipment as per	<u>¥</u>
	Has all a	ppropriate in	formation beer	recorded in the Fi	√B?	X
	Have the	e weather con	ditions been re	corded?		<u> </u>
	Are wea	ther condition	ns affecting san	ple quality?		N
	Is the Ch	nain of Custoo	ly being mainta	nined for the sampl	es?	Y
	Have all present?	-	en properly tra	ined to operate the	equipment	Y
	Are the personn	•	he sampling ac	tivities understood	by the field	Y
	Are emp	oloyees condu	cting the inves	tigation in a profes	sional manner?	Y
Signed-by:-	Sampler:	-April	4	Print Name:	Bryan Foulte	
	Date:	5/21/9	9	_		

APPENDIX H	
LITHOLOGIC AND CONSTRUCTION WELL LOGS	
·	

SOIL BORING LOGS

売つ No:	72208.00.01		Date C	ompleted	12 Aug 98		
pject I	R.F.I.	Owner Occidental Chemi			cal Corporation		
Location 1	Del. City, Del.	Bore Depth (ft) 10			Diameter	8.25	
North		Surface Elev	Surface Elev				
East -		Riser Elev			feet msl		
Screen	NA	Length (ft)			Diameter		
Slot Size	NA	Stabilized D	TW	2.50	feet TOC		
Riser	NA	Length (ft)	_		Diameter		
Drilling Meth	od HS Auger	Driller	Dennis M	Лооге	- Geologist	Bill Gordon	
Drilling Co.	ADT-MA Tr	enton. New Jers		Pa. Geo. No.	. PG-001466-G		

SB-10



			<u> </u>					
	Depth (feet BGS)	PID Reading (ppm)	Well Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)	·	Sample Description/Classification
						-		
							Recovery	· · · · ·
}	<u> </u>						per 24"	Description
	0		-	0		0-2	24/24	0-8" SAND,silty, trace clay, dark brown,soft,
,				,				organic-rich material.
·· — · —								8-18" SAND, silty,medium orange-brown.
<u> </u>		-	<u> </u>	<u> </u>				18-24" CLAY, silty, dark brown, hard, plastic.
•	_			-				,
	2			0		2-4	21/24	0-5" SAND, silty, light orange-brown, wet.
								5-9" CLAY, silty, soft, pliable.
								9-21" CLAY, silty, dark grey, mottled. Black shiny
					<u> </u>			tar-like substance near bottom of spoon.
		-	ı		- :-			Rounded quartz pebbles present.
	4	·		. 0		4-6	18/24	0-8" SAND, silty, black to dark grey, moist.
			<u> </u>					8-10" SAND, silty, light brown.
			1					o to the party again storm.
						-		
		·	 				,	-
	6			0	-	6-8	16/24	0-2" mixed CLAY, silty, light orange and SAND, dark
	 					<u> </u>	10127	grey, silty, wet.
			 		-		 	2-16" CLAY, silty, light orange-grey, soft, moist.
			 		_		-	2 20 02/11 may, agait orange-groy, sort, moist.
	 							
	. 8		 	0		8-10	24/24	0-10" SAND, silty, Light brown orange, wet.
<u> </u>	-		 			0-10	24/24	10-24" CLAY, silty, light orange brown, with
		_					 	large rounded quartz pebbles.
L		L	<u> </u>	<u> </u>			L	range rounded quartz peoples.

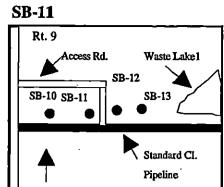
"O No:	72208.00.01	Date (Date Completed 12 Aug 98					
joject i	R.F.I.	Owner Occider	ical Corporation					
Location	Del. City, Del.	Bore Depth (ft)	10	Diameter	8.25			
North		Surface Elev		feet msl				
East _		Riser Elev		feet msl				
Screen	ŅA	Length (ft)		Diameter				
Slot Size	NA	Stabilized DTW	2.50	féet TOC				
Riser	NA .	Length (ft)	Length (ft)					
Drilling Meth	od HS Auger	Driller Dennis	Moore	Geologist	Bill Gordon			
Drilling Co.	ADT-MA Tr	enton, New Jersey		Pa. Geo. No. PG-001466-G				

Rt. 9
Access Rd. Waste Lake1
SB-10 SB-11
SB-13

Standard Cl.
Pipeline

Drilling Co.	ADT-N	MA Trenton	, New Jer		10010	Pa. Geo. No. PG-001466-G
			<u>, </u>			
Depth (feet BGS)	PID Reading (ppm)	Well Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)	Sample Description/Classification
	<u> </u>					
10						
Lithologic samples						
split-spoons (2 inch				nism		
was a 140 pound ha						
Blow counts were re	corded	per 0.5 100t	intervai.			
The 8.25-inch I.D.b	orehole v	was advance	d to 10 ft	bgs.		
with continuous spli				-6-,		
-						
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						<u> </u>
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<u></u>			•			
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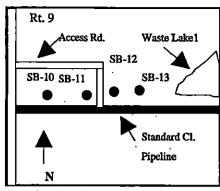
····つ No:	72208.00	.01		Date Completed 13 Aug 98							
ject	R.F.I.		Owner Occidental C			ical Corporation					
Location	Del. City, Del.		Bore Depth (ft)		10 Diameter		8.25				
North			Surface Ele	Surface Elev							
East		_	Riser Elev			feet msl					
Screen	-	NA	Length (ft)			- Diameter					
Slot Size		NA	Stabilized D	Stabilized DTW		feet TOC					
Riser	NA		Length (ft)	Length (ft)		Diameter					
Drilling Meth	ethod HS Auger		Driller	Driller Dennis Moore		Geologist	Bill Gordon				
Drilling Co.	Ā	DT-MA Tr	— enton, New Jen	ton, New Jersey			Pa. Geo. No. PG-001466-G				



	т т	Т		т	_		1	
	Depth (feet BGS)		Well Construction	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
							Recovery	
	1						per 24"	Description
	0	一		0	7-10	0-2	15/24	0-6" CLAY, silty, dark red brown, organic-rich.
					14-8			6-15" CLAY, silty to sandy, light grey, trace gravel.
			-					
	2			0	5-6	2-4	11.5/24	0-2" CLAY, silty to sandy, light grey, trace gravel.
					6-5			2-11.5" CLAY, silty, light orange brown, moist.
	4			0	7-8	4-6	22/24	0-22" CLAY, silty, mottled, light orange brown to grey
					11-14			with trace sand and gravel, moist.
								
	<u> </u>		-		-			
	6			4-6	14-48	6-8	20/24	0-4" CLAY, silty, mottled, lt orange brown, grey, red.
	1	$\neg \uparrow$	•		62-77			4-20" SAND, silty, light orange, fine to med. grained,
	1 1	$\neg \uparrow$						mod. well sorted, wet at 6'.
•	1 1			1				
1	 			1				
	8			0.2-0.5	8-16	8-10	23/24	0-23" CLAY, silty, mottled light tan to brown and grey,
		— 			43-50		20121	with thin silt and fine sand lenses, stiff to brittle.
	- 	-+		1				
L	LL						l	

oN C'''	7220	8.00.01		Date Completed 13 Aug 98							
oject	R.F.I.	· ·	Owner	Occiden	tal Chem	ical Corporation					
Location	Del. 0	City, Dėl.	Bore Depth (ft) 10			Diameter	8.25				
North		· · · · · ·	Surface El	Surface Elev			feet msl				
East	-		Riser Elev			feet msl					
Screen		NA	Length (ft)			Diameter					
Slot Size		NA	Stabilized	DTW	9.00	feet TOC					
Riser		NA	Length (ft)	Length (ft)		Diameter					
		HS Auger	Driller	Dennis I	Moore	Geologist	Bill Gordon				
		ADT-MA Tr	enton, New Je	ersey		Pa. Geo. No. PG-001466-G					

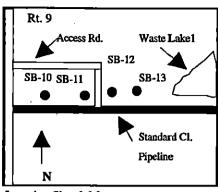
SB-11



	Depth (feet BGS)		Well	Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)	Sample Description/Classification
ļ ————	,		ļ-			-		
*.	10							
	_							
Lithologic sa								
split-spoons			_			nism 		
was a 140 pe								
Blow counts	were re	corded p	per 0.5	foot	interval.	•		
m 0.05 :		11			. 10.6	<u> </u>		
The 8.25-inc				vance	4 10 10 11	ogs,	•	
With continu	ions sbui	spoons	<u> </u>					
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				-,.		<u> </u>		
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·''') No:	72208.00.01		Date Completed 13 Aug 98									
ject	R.F.I.	Owner	Occide	ntal Chem	ical Corporation	•						
Location	Del. City, Del.	Bore Dept	h (ft)	14	Diameter	8.25						
North		Surface El	ev		feet msl							
East		Riser Elev	,		feet msl							
Screen	NA	Length (ft))	,	Diameter							
Slot Size	NA	Stabilized	DTW [*]	6.82	feet TOC							
Riser	NA	Length (ft))		Diameter							
Drilling Meth	od HS Auger	Driller	Dennis	Moore	Geologist	Bill Gordon						
Drilling Co.	ADT-MA Tr	— enton. New Je	ersev		Pa. Geo. No.	. PG-001466-G						

SB-12



		~-		•	-
COOL	100	Ske	hah.	R./	ne

_										
	Depth (feet BGS)		Well	Construction Schematic	PID Reading (PPM)		Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
		_				ŀ				
	_				<u> </u>				Recovery	
						┵			per 24"	Description
	0				<u> </u>	0	6-8	0-2	18/24	0-18" SAND, silty, med. orange brown, mixed with
							12-15	 		limestone fill material.
						\perp				
			_			\bot			<u> </u>	
.	<u> </u>		ļ.,		<u> </u>	4-				
	2		1		<u> </u>	_	31-24	2-4	20/24	0-20" SILT, sandy, light orange grey, with
			<u> </u>		<u> </u>		22-16			limestone and schist fill material.
	<u> </u>		ļ.		_	_				<u> </u>
_		,	_		 	_				
<u>.</u>			╆.		ļ	-				
	4		<u> </u>		<u> </u>		20-17	4-6	16/24	0-16" SILT, sandy, light grey-orange, with
	<u> </u>		<u> </u>		<u> </u>	4	16-16			schist fill material, dry.
	<u> </u>		<u> </u>		<u> </u>					
			╀		ļ. —	_				
	<u> </u>		-	_	ļ	4			 	
	6	<u> </u>	1	_	4-6	+	5-4	6-8	13/24	0-8" SILT, sandy, light orange brown, with red
	<u> </u>		1		ļ	\perp	3-2			rounded quartz pebbles.
	 		\perp			_				8-13" CLAY, silty, light orange brown, moist to wet,
	 -	·	<u> </u>		—-	\bot				organic odor.
	<u> </u>	 -	₽-			\bot				
	8		↓_		2-3.5	\perp	2-1	8-10	4/24	0-4" CLAY, silty, light orange brown, moist.
	<u> </u>	<u> </u>	1		ļ	\bot	1-2			
	I	l	1		1	- (I	

I.	Owner	Ossidani				
		Occident	tal Chem	ical Corporation	á	
City, Del.	Bore Depth	(ft)	14	Diameter	8.25	
	Surface Ele	v		feet msl		
	Riser Elev			feet msl		
NA	Length (ft)			Diameter		
, NA	Stabilized I	TW	6.82	feet TOC		
NA	Length (ft)			Diameter		
HS Auger	Driller	Dennis N	loore .	Geologist	Bill Gordon	
rilling Co. ADT-MA Tr		sey		Pa. Geo. No. PG-001466-G		
	NA NA HS Auger	NA Stabilized I NA Length (ft) HS Auger Driller	NA Stabilized DTW NA Length (ft)	NA Stabilized DTW 6.82 NA Length (ft) HS Auger Driller Dennis Moore	NA Stabilized DTW 6.82 feet TOC NA Length (ft) Diameter HS Auger Driller Dennis Moore Geologist	

Rt. 9

Access Rd. Waste Lake 1

SB-10 SB-11

SB-12

SB-13

Standard Cl.

Pipeline

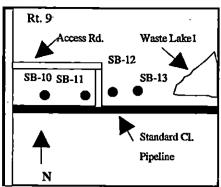
Location Sketch Map

SB-12

		-						_	
-	Depth (feet BGS)		Well	Construction	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
							·		<u> </u>
	10				5-34	10-12	10-12	12/24	0-6" SAND, silty, light orange brown, dry.
						11-9	_		6-12" CLAY, silty, light orange brown, soft, moist.
<u></u> ,									
<u> </u>								_	<u> </u>
	12			_	114		12-14	16/24	0-4" CLAY, silty, light orange brown, soft, wet.
	ı						ż		4-8" SILT, sandy, light orange brown.
	1						-	 	8-12" SAND, light orange brown.
	 	-					,		12-16" CLAY, orange to black, staining?
				r	-				Strong odor,
	14					_			
ithologic sa	amnles we	re colli	ecte	d with	etandard				<u> </u>
plit-spoons						ism -			<u>.</u>
vas a 140 po									
Blow counts									
			-			<u>`</u>			
 Гће 8.25-inc	h I.D.bore	ehole w	vas a	idvance	d to 14 ft	bgs,			ş
eith continu						<u> </u>			
		<u>-</u>							
:									
									
			-						

No:	72208.00.01	Date			
ject	R.F.I.	Owner Occid	ental Chem	ical Corporation	
Location	Del. City, Del.	Bore Depth (ft)	8	Diameter	8.25
North		Surface Elev		feet msl	
East		Riser Elev		feet msl	
Screen	NA	Length (ft)		Diameter	•
Slot Size	NA	Stabilized DTW	7.00	feet TOC	
Riser	NA	Length (ft)		Diameter	
Drilling Meth	od HS Auger	Driller Denni	s Moore	Geologist	Bill Gordon
Drilling Co.	ADT-MA Tr	enton. New Jersev		Pa. Geo. No.	. PG-001466-G

SB-13

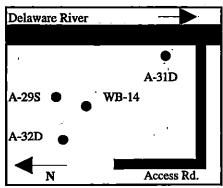


	Depth (feet BGS)		Well	Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
Г .								Recovery	
				_				per 24"	Description
	0				>2500	4-4	0-2	16/24	0-10" SILT, sandy, light orange, with organic material.
						7-10			10-16" CLAY, silty, light tan to brown.
									Organic odor.
							٠١		
									· · · · · · · · · · · · · · · · · · ·
	2		<u> </u>		120	6-6	2-4	18/24	0-16" CLAY, sandy to silty, light orange, soft, moist
		•				9-10			plastic.
									16'18" CLAY, silty, dark grey to black, soft, moist.
		_				,			
	4	· ·			0	7-5	4-6	24/24	0-6" CLAY, sandy to silty, light tan.
						4-7		, 	6-24" CLAY, silty, mottled dark grey to black, soft.
	<u> </u>	<u> </u>							<u> </u>
	6				1550	4-5	6-8	24/24	0-10" PEAT, all plant material, wet.
						6-4	_		10-24" CLAY, grey to black, soft.
<u> </u>								,	
	8								
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								, L <u> </u>	
									· · · · · · · · · · · · · · · · · · ·

Enviro	nmer	ital I	Resou	rce	s Ma	anage	ment			SB-13		
⊴O No:	72208		•	ř				18 Aug 98	_	Rt. 9 Access Rd.	Waste Lakel	
,	R.F.I.	.00.01	:	<u>.</u>	ner		_	ical Corporation		 		
oject		Etra Dal		_				Diameter	8.25	SB-10 SB-11	SB-12 SB-13	
ocation	Del. C	ity, Del.		- :	re Depth face Ele		8	- . –	6.23	2P-10 2B-11	• • •	
orth				_		V		feet msl	•			
ast				-	er Elev		-	feet msl				
creen		NA			ngth (ft)			_ Diameter_	•	· 🛖	Standard Cl.	
lot Size	~	NA	<u> </u>	-	Stabilized DTW 7.00			_ feet TOC		· 11 - !_	Pipeline	
iser		NA		_	ngth (ft)			_ Diameter_		N .		
rilling Me			IS Auger				nnis Moore Geologist		Bill Gordon	Location Sketch Mag	P	
rilling Co.		ADT-I	MA Trei	iton,	New Jer	sey	<u> </u>	Pa. Geo. No	. PG-001466-G			
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							±		•		•	
				ŀ						•	<u>.</u>	
÷		1			_		_			:	¥	
	ြ				PID Reading (PPM)	E.	Sample (feet BGS)					
	BG				<u>a</u>	.5 f	Ä		Sample Description	n/Classification		
	Depth (feet BGS)		Well Construction	ည္	ing	Blows per 0.5 feet	<u>ş</u>					
	(£)	1	ğ	Schematic	ead	S D	je					
	ept		Well	jè.) R	low *Sol						
	Ω		≥ 0	Š	Ш	m	Š					
								, z				
hologic s	amples	were col	llected v	rith s	tandard				<u> </u>	•		
it-spoons		 				nism ·	-	· -				
as a 140 pc										· · · · · · · · · · · · · · · · · · ·	•	
								 			· · · · · · · · · · · · · · · · · · ·	
low counts	were r	ecorded	per 0.5	10011	HICI VAI.			} .		 -	<u> </u>	
	_			· ·				ļ	•		· -	
ne 8.25-inc	h I.D.b	orehole	was adv	ance	d to 8 ft	bgs.	• • •	**.	·			
ith continu	ious spl	it spoon	S.					[,	
						-						
	•							, i				
<u> </u>			· ·					·	· · · -	.	`	
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<u> </u>			1			<u>. </u>		ļ			·	
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						<u></u>	<u></u>		<u> </u>	<u> </u>	<u></u>	
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Date Completed 19 Aug 98 WO No: 72208.00.01 Owner Occidental Chemical Corporation R.F.I. oject Bore Depth (ft) 8.25 Location Del. City, Del. 10 Diameter Surface Elev feet msl North Riser Elev feet msl East Diameter Screen NA Length (ft) Stabilized DTW feet TOC NA Slot Size Diameter NA Length (ft) Riser Bill Gordon Driller Dennis Moore Geologist **Drilling Method HS Auger** Pa. Geo. No. PG-001466-G ADT-MA Trenton, New Jersey Drilling Co.

WB-14



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Location Sketch Map

						_				A
		Depth (feet BGS)		Well	Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)	,	Sample Description/Classification
Γ								٠		· .
\bot									Recovery	, (
ļ								2	per 24"	Description
Γ	_	0	-			0.4	6-7	0-2	15/24	0-6" SILT, sandy, dark brown, moist, w/ abund. roots.
Γ							8-4			6-15" SILT, sandy, med. brown orange, soft, moist.
Γ	_					_				
r								ē.		
Γ										
Γ		2.				0.5	3-2	2-4	17 <i>/</i> 24	0-4" SILT, sandy, medium brown orange, dry.
Ţ							4-6			4-17" CLAY, silty, dk. grey to black, micaceous, moist.
ľ						•	:			moist, with plant material.
ľ							÷			
ı		-							_	
İ		4				0.8	4-3	4-6	24/24	0-5" SILT, sandy, dark brown,peat-like.
ſ	_				-		2-2			5-24" CLAY, silty, black, soft, moist.
ļ										·
╘				Γ						
				Γ	-			,		
t		6		T		4.0	4-4	6-8	24/24	CLAY, silty, dark grey to black, soft, moist.
ľ			1	T			2-1			With organic material.
1		:		T						
		 -	†	T				<u>_</u>		:
T				\vdash						
ŀ		8	-	┢		1.0	3-2	8-10	24/24	CLAY, silty, dark grey to black, moist,
ļ			1	T			1-2			with plant material.
t			-	Τ						
L		<u> </u>	Ь	_					·	

Enviro	nmen	tal F	lesou	rce	s Ma	anagei	ment			WB-14
	•			•				. 10 4 .00		Delaware River
····) No:	72208.	00.01		_			-	19 Aug 98		
ject	R.F.I.				ner .			ical Corporation Diameter	8.25	·
Location	Del, Ci	ity, Del.			re Depth		10	_ Diameter _ feet msl	8.25	_ A-29S ● _ WB-1
North					face Ele	e v		-		A-29S • WB-1
East					er Elev			feet msl		4 207
Screen		NA		Length (ft)				Diameter_		_ A-32D •
Slot Size		NA		Stabilized DTW _				_feet TOC _		- 🕳 =
Riser		NA			ngth (ft)		·	_ Diameter_	D''' G 1	N N
Drilling Me		HS Au			iller	Dennis l	Moore	_ Geologist _	Bill Gordon	Location Sketch Map
Drilling Co.	•	ADT-N	MA Trent	ton,	New Jer	sey		Pa. Geo. No.	PG-001466-G	_
	Depth (feet BGS)		Well Construction	Construction Schematic PID Reading (PPM) Blows per 0.5 feet		Blows per 0.5 feet	Sample (feet BGS)		ample Descripti	on/Classification
						<u> </u>			· ·	
<u>. </u>	10	<u> </u>	_	_		-	-			•
<u> </u>		<u> 1 </u>	<u> </u>			<u> </u>	L			
Lithologic s	amples v	were col	llected w	ith s	tandard				:	
split-spoons				_		anism				
was a 140 p	ound ha	mmer di	ropped 30	0-in	ches.					
Blow count										
							_			

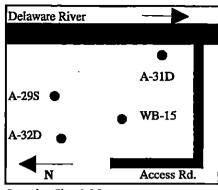
The 8.25-inch I.D.borehole was advanced to 10 ft bgs.

with continuous split spoons.

Access Rd.

Date Completed 25 Aug 98 TO No: 72208.00.01 Owner Occidental Chemical Corporation R. F.I. ject Location Del. City, Del. Bore Depth (ft) Diameter 8.25 Surface Elev feet msl North Riser Elev feet msl East Length (ft) Diameter NA Screen feet TOC NA Stabilized DTW Slot Size Diameter NA Length (ft) Riser Driller Dennis Moore Geologist Bill Gordon Drilling Method **HS Auger** Pa. Geo. No. PG-001466-G Drilling Co. ADT-MA Trenton, New Jersey

WB-15

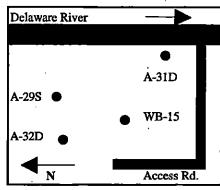


Location Sketch Map

	Depth (feet BGS)	Well	Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
<u> </u>		-					Recovery	
		 -	_			•	per 24"	Description
	0			0,0	4-8	0-2	19/24	SILT, sandy, medium orange brown, with limestone
 		 -			12-12	-		and quartzite fill material, trace clay and plant roots.
		\vdash						
-		 \vdash	_					
· ·								
	2	 Ė	_,	0.9	14-8	2-4	18/24	0-11" SILT, sandy, medium orange.
					5-8			11-18" CLAY, silty, soft, moist.
			•		c			
	4	 -	-	2.2	5-3	4-6	20/24	0-16" CLAY, silty, grey to black, soft, moist.
					2-2	-,		16-20" CLAY, silty, black, moist, abundant plant
								material.
		ļ						
	6			10.5	2-2	6-8	24/24	CLAY, silty, dark grey to black, soft, moist.
			i		1-1	-		
			ì					·
;					. 7			
	,							·
	8		-					

Date Completed 25 Aug 98 "") No: 72208.00.01 R. F.I. Owner Occidental Chemical Corporation ject Bore Depth (ft) Location Del. City, Del. Diameter 8.25 Surface Elev feet msl North Riser Elev feet msl East Screen NA Length (ft) Diameter feet TOC NA Stabilized DTW Slot Size Diameter NA Length (ft) Riser Driller Dennis Moore Geologist Bill Gordon **Drilling Method HS** Auger Pa. Geo. No. PG-001466-G Drilling Co. ADT-MA Trenton, New Jersey

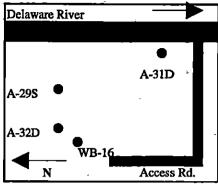
WB-15



						1	
·	Depth (feet BGS)	Well Construction	Schematic PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)	Sample Description/Classification	,
Lithologic s	amples we	ere collected wit	th standard				
t-spoons	(2 inch x	2 feet). The dri	ving mecha	nism			
		mer dropped 30					<u></u>
Blow counts	were reco	orded per 0.5 for	ot interval.				
The 8.25-inc		ehole was advar	nced to 8 ft l	ogs.			
VIIII COIIIIII	ous spires				-		
							· · · · · · · · · · · · · · · · · · ·
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	_						
	_						
							<u> </u>
		. .					
	-					<u></u>	

72208.00.01 Date Completed 19 Aug 98 YO No: R.F.I. Owner Occidental Chemical Corporation oject Del. City, Del. Bore Depth (ft) 10 Diameter 8.25 Location Surface Elev feet msl North Riser Elev feet msl East NA Length (ft) Diameter Screen Slot Size NA Stabilized DTW feet TOC Length (ft) Diameter Riser NA Geologist Bill Gordon **Drilling Method HS Auger** Driller Dennis Moore ADT-MA Trenton, New Jersey Pa. Geo. No. PG-001466-G Drilling Co.

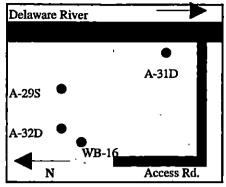
WB-16



		Depth (feet BGS)		Well	Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
						4		- :	D	
				-	,		- !		Recovery per 24"	Description
Ŧ	-	0		-		0.5	3-5	0-2	18/24	SILT, sandy, light to med. brown, with abundant
ŀ	7	U		\vdash	<u> </u>	0.5	5-9	U-Z	10/24	plant material and roots.
ŀ				-			3-7			pune nuterius and 1006.
ŀ										· · · · · · · · · · · · · · · · · · ·
ŀ										· · · · · · · · · · · · · · · · · · ·
ŀ		2				13.4	5-3	2-4	24/24	0-10" SILT, sandy, medium brown orange, with peat.
ŀ							3-2		;	10-24" CLAY, silty, med. grey to black, very soft, wet.
۱	-	_								
ľ							-			
İ			•		-					
Ī		4		•	_	1400.0	1-1	4-6	24/24	CLAY, silty, dk. grey to black, wet.
ſ							1-1			Organic odor.
_[
ſ										
		6				2100.0	1-1	6-8	24/24	CLAY, silty, dark grey to black, soft, moist.
ſ							1-1			With plant material.
4										Strong odor.
Ę										
L		8				1400.0		8-10	24/24	CLAY, silty, dark grey to black, wet,
			L	L			1-1			with plant material.
ł			L	L						<u>.</u>

WO No:	72208.00.01	Date C	Complete	d 19 Aug 98		
oject I	R.F.I.	Owner Occiden	tal Chem	ical Corporation		
Location 1	Del. City, Del.	Bore Depth (ft)	10	Diameter	8.25	
North -		Surface Elev		feet msl		
East		Riser Elev		feet msl		
Screen	NA	Length (ft)		Diameter		
Slot Size	NA	Stabilized DTW		feet TOC		
Riser	NA	Length (ft)		Diameter		
Drilling Meth	od HS Auger	Driller Dennis l	Moore	Geologist	Bill Gordon	
Drilling Co.	ADT-MA Tr	enton, New Jersey		Pa. Geo. No. PG-001466-G		

WB-16



	Depth (feet BGS)		Well Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)	Sample Description/Classification
	<u> </u>	- 1		<u> </u>			
	10			<u> </u>		L	
Lithologic sa	amples wer	re colle	ected with	standard			<u> </u>
split-spoons					nism		
was a 140 pc							
Blow counts					_	6	·
The 8.25-inc				ed to 10 ft	bgs.		
with continu	ous split sp	poons.					
							
		_	· ·		_	.	
							· · · · · · · · · · · · · · · · · · ·
	 -						
		-					
		_					
	-		•		-		
<u> </u>					_		

™O No:	72208.00.01		Date Comple	ted 19 Aug 98	
_ject	R.F.I.	Owner	Occidental Che	emical Corporation	
	Del. City, Del.	Bore Dept	h (ft) 12	Diameter	8.25
North -		Surface El	lev	feet msl	
East		Riser Elev	,	feet msl	
Screen	NA	Length (ft)) —	Diameter	
Slot Size	NA	Stabilized	DTW	feet TOC	<u> </u>
Riser	NA	Length (ft)) —	Diameter	
Drilling Meth	od HS Auger	Driller	Dennis Moore	Geologist	Bill Gordon
Drilling Co.	ADT-MA T	Trenton, New Je	ersey	Pa. Geo. No	o. PG-001466-G

Delaware River WB-17 A-31D A-29S A-32D

Access Rd.

Location Sketch Map

WB-17

									<u> </u>
	Depth (feet BGS)	·	Well	Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
	_								
							<u> </u>	Recovery	
								per 24"	Description
	0				0.0	3-19_	0-2	21/24.	SILT, sandy, mottled light tan to grey, hard, dry, iron
						16-23			stained, with roots.
			L						<u> </u>
			<u> </u>						
						_			
	2		L		0.0	16-13	. 2-4	15/24	0-3" SILT, sandy, mottled light tan to grey, with roots.
		_				16-21			3-15" SILT, sandy, light grey to grey white, soft,
		_							trace gravel and roots.
								•	
· _	4		Γ		0.0	9-5	4-6	24/24	0-6" SILT, sandy, light grey to grey white.
	_					6-6			6-12" SILT, light to medium brown, dry, with peat.
									12-24" CLAY, black, soft, moist, with plant material.
		·	Г					-	
			Γ						
	6		Г		3.4	4-4	6-8	24/24	CLAY, silty, dark grey to black, soft, moist.
			Ī			2-2			Organic odor.
			T		1				
*			Η						
I ————			H						
	8		t		0.6	2-1	8-10	16/24	CLAY, silty, dark grey to black, moist to wet,
			\vdash	<u> </u>		2-2		13/21	with abundant plant material.
		-	\vdash						Fem. 1
ł		I	1		1			I	

⊸o No:	72208.00.01		Date Comple	eted 19 Aug 98	
jject	R.F.I.	Owner	Occidental Che	emical Corporation	
Location	Del. City, Del.	Bore Dep	th (ft) 12	Diameter	8.25
North -	•	Surface E	lev	feet msl	•
East -		Riser Elev	,	feet msl	•
Screen	NA	Length (ft)	Diameter	
Slot Size	NA	Stabilized	DTW	feet TOC	
Riser	NA	Length (ft		Diameter	
Drilling Meth	od HS Auger	Driller	Dennis Moore	Geologist	Bill Gordon
Drilling Co.	ADT-MA Tr	enton. New Jo	ersev	Pa. Geo. No	p. PG-001466-G

WB-17
Delaware River

WB-17
A-31D

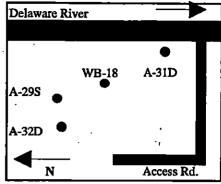
A-32D

Access Rd.

Drilling Co.	ADT-N	MA Trentor	, New Jers	ey	*1001C	Pa. Geo.	No. PG-001466-G	
Depth (feet BGS)		Well Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification	-
10			0.0	2-1	10-12	16/24	CLAY, silty, dark grey to black, moist to wet,	
				1-1			with abundant plant material.	
		 					<u> </u>	$\dot{\dashv}$
	·						· · · · · · · · · · · · · · · · · · ·	\dashv
1:	+	 					· · · · · · · · · · · · · · · · · · ·	_
<u></u>	4	<u> </u>	<u> </u>					j.
Lithologic samples	were coll	lected with	standard					\dashv
split-spoons (2 inch				ism				-
was a 140 pound ha	mmer dr	opped 30-i	nches.					
Blow counts were r	ecorded p	per 0.5 foot	interval.					
The 8.25-inch I.D.b				bgs.			·	4
with continuous spl	it spoons							\dashv
							<u> </u>	_
		<u>-</u>						-
				-		<u>-</u>		\dashv
-						•		\dashv
· · · · · · · · · · · · · · · · · · ·	-					·		
								\Box
			_					

",) No:	72208.00.01		Date Complet	ted 18 Aug 98	
,iject	R.F.I.	Owner	Occidental Che	mical Corporation	
Location	Del. City, Del.	Bore Depti	14 (ft) 14	Diameter	8.25
North		Surface Ele	ev	feet msl	,
East		Riser Elev		feet msl	·
Screen	NA	Length (ft)		Diameter	_
Slot Size	NA	Stabilized 1	DTW	feet TOC	
Riser	NA	Length (ft)	-	Diameter	
Drilling Meth	nod HS Auger	Driller	Dennis Moore	Geologist	Bill Gordon
Drilling Co.	ADT-MA Tr	enton, New Je	rsey	Pa. Geo. No	. PG-001466-G

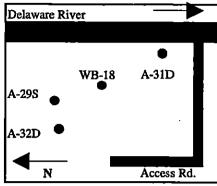
WB-18



									·
	Depth (feet BGS)		Well	Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
									<u> </u>
			1					Recovery	
								per 24"	Description
	0				0.2	9-9	0-2	21/24	SAND, silty, light brown,dry, with roots, trace grey
-						9-10			gravel and sand lenses,
				•					
						_		_	
						-			
	2			,	0.0	12-14	2-4	16/24	SILT, sandy, light brown, mottled, with limestone and
,						15-8	ı		asphalt fill material.
			Ī	_					
								_	, ;
-	4				0.0	1-2	4-6	4/24	SILT, sandy, light brown, mottled.
			T		1	2-3			
.									
,			\dagger		 				· · · · · · · · · · · · · · · · · · ·
	6		╆		0.0	1-2	6-8	4/24	SILT, sandy, light brown, mottled.
	 		\vdash	-	1	2-1		7/27	i i
	 	<u> </u>	+		 	2-1			<u>.</u> .
<u> </u>			-						
	<u> </u>		\vdash						
			┢		6.5	12	8-10	10/04	CLAV city days grow to block with this light ton
	- 8		-		6.5	1-2	9-10	12/24	CLAY, silty, dark grey to black, with thin light tan,
	 -		_		 	2-1			sandy stringers.
	ŀ		1		1				

ONo:	72208.00.01	Date Com	pleted 18 Aug 98	
ာject	R.F.I.	Owner Occidental (
Location	Del. City, Del.	Bore Depth (ft)	14 Diameter	8.25
North		Surface Elev	feet msl	
East		Riser Elev	feet msl	
Screen	NA	Length (ft)	Diameter	
Slot Size	NA	Stabilized DTW	feet TOC	
Riser	NA	Length (ft)	Diameter	
Drilling Meth	od HS Auger	Driller Dennis Moo	re Geologist	Bill Gordon
Drilling Co.	ADT-MA Tr	enton, New Jersey	Pa. Geo. No	o. PG-001466-G

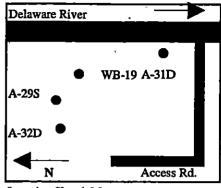
WB-18



	Depth (feet BGS)		Well Construction	Schematic PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)	Sample Description/Classification
	10			2.0	2-1 1-1	10-12	12/24 CLAY, silty, dark grey to black,soft.
	12			0.0	2-1	12-14	10/24 CLAY, silty, dark grey to black, soft.
					1-1		
	14						
Lithologic sa split-spoons					 nism		
was a 140 po	und ham	mer dr	opped 30	-inches.		_	
Blow counts	were rec	orded p	per 0.5 fo	ot interval.			
The 8.25-inc	h I.D.boz	ehole v	vas adva	iced to 14 ft	bgs.		
h continu	ous split	spoons					
	-	•					· · · · · · · · · · · · · · · · · · ·

O No: 72208.00.01 Date Completed 20 Aug 98 R.F.I. Owner Occidental Chemical Corporation ____ject Location Del. City, Del. Bore Depth (ft) 12 Diameter 8.25 Surface Elev North feet msl Riser Elev East feet msl NA Length (ft) Diameter Screen feet TOC NA Stabilized DTW Slot Size Diameter Riser NA Length (ft) **Drilling Method** Driller Dennis Moore Geologist **HS Auger** Bill Gordon Drilling Co. ADT-MA Trenton, New Jersey Pa. Geo. No. PG-001466-G

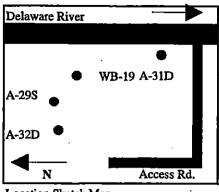
WB-19



	Depth (feet BGS)	i.	Well	Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
				_	 			,	
 								Recovery	
		-						per 24"	Description
-	0		-		2.0	4-7	0-2	18/24	SILT, sandy, lt. to med. brown, dry, hard, with plant
						11-14			material, red CLAY lens at 6",
				•					
	2				2.4	21-12	2-4	17/24	0-7" SILT, sandy, med. brown, dry, harder.
						11-8			7-17" CLAY, silty, dark brown, soft, moist.
	4				2.0	3-3	4-6	24/24	CLAY, dark grey to black, micaceous, soft, moist.
						2-2			
<u> </u>					- <u></u>			<u>-</u>	
								·	
	6	,			8.0	1-1	6-8	24/24	CLAY, silty, med. grey to black, soft, moist.
						1-2			Abundant plant material.
(<u> </u>			,						
	8				21.0	1-1	8-10	24/24	CLAY, silty, med. grey to black, soft, moist.
						1-1			Abundant plant material.

Date Completed 20 Aug 98 72208.00.01 "ONo: Occidental Chemical Corporation Owner R.F.I. ject Bore Depth (ft) Diameter Location Del. City, Del. 12 8.25 Surface Elev feet msl North Riser Elev feet msl Eást Length (ft) Diameter NΑ Screen Stabilized DTW feet TOC NA Slot Size Diameter NA Length (ft) Riser Driller Geologist Bill Gordon **Drilling Method HS** Auger Dennis Moore Pa. Geo. No. PG-001466-G Drilling Co. ADT-MA Trenton, New Jersey

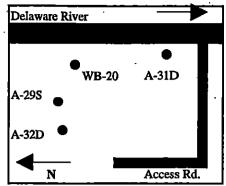
WB-19



		·					
	Depth (feet BGS)		Well Construction	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)	Sample Description/Classification
			_	T #4			
· -							
	10			4.0	1-1	10-12	24/24 CLAY, silty, dark grey to black, with abundant plant
					1-1		material, soft, wet.
							·
				<u> </u>		<u> </u>	<u> </u>
				1			
	12		<u> </u>	<u></u> .		<u> </u>	
Lithologic sa	mnlec w	ere coll	lected with	etandard	<u></u>		- 22222
split-spoons					nism		
was a 140 po							
Blow counts							
	-						
The 8.25-inc	h I.D.boı	ehole v	vas advano	ed to 12 ft	bgs.		
with continu	ous split	spoons	·—				
	·						
·		_		<u>-</u>			
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*O No:	72208.00.01	Date				
.∜ject	R.F.I.	Owner Occid	ental Chem	ical Corporation		
Location	Del. City, Del.	Bore Depth (ft)	10	Diameter	8.25	
North		Surface Elev		feet msl		
East		Riser Elev		feet msl		
Screen	NA	Length (ft)		Diameter		
Slot Size	NA	Stabilized DTW	•	feet TOC		
Riser	NA	Length (ft)		Diameter		
Drilling Meth	od HS Auger	Driller Denni	s Moore	Geologist	Bill Gordon	
Drilling Co.	ADT-MA T	renton, New Jersey	Pa. Geo. No. PG-001466-G			

WB-20

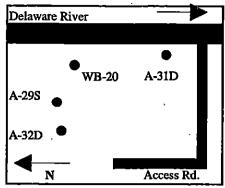


Location Sketch Map

		Depth (feet BGS)		Well	Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)	er	Sample Description/Classification
L		_								· · · · · · · · · · · · · · · · · · ·
									Recovery	The sale of the sa
Ë	_								per 24"	Description
F		0		 		0,0	4-3	0-2	22/24	SILT, sandy, light to med. brown, soft, moist with
\vdash			-	_			10-14			rounded quartz pebbles.
-										
H		-,		 		-	•			
\vdash		2				0.0	9-5	2-4	16/24	0-6" SILT, A/A
\vdash				-		- 0.0	6-7	2-7	10/24	6-16" CLAY, silty, dark to med. grey, dry, hard, with
\vdash				\vdash	: -					abundant plant material.
\vdash					•					abundant plant material.
-	 -									
H		4				0.3	4-4	4-6	24/24	0-4" SAND, silty, brown, dry.
r			_				2-2			4-24" CLAY, silty, dk grey black, soft, moist, with
_ _									·	plant material.
+				-						
				I^-		· -				
上		6		┢		1.2	2-1	6-8	24/24	CLAY, silty, dk. grey black, with abundant plant
卜							1-2			material.
H								<u> </u>		· · · · · · · · · · · · · · · · · · ·
	*									
Í	-			T						ŧ ·
		8		┢		3.0	1-1	8-10	4/24	CLAY, silty, dk. grey black, with abundant plant
卜						1	1-1	,		material, wet.
t				†						

No:	72208	3.00.01	_				
oject	R.F.I.		Owner	Occidental Ch	emical Corporation		
Location	Del. (City, Del.	Bore Dep	oth (ft) 10	Diameter	8.25	
North			Surface E	llev	feet msl		
East			Riser Ele	v	feet msl		
Screen		NA	Length (f	t)	Diameter		
Slot Size		NA	Stabilized	DTW	feet TOC		
Riser NA			Length (f	t)	Diameter		
Orilling Method		HS Auger	Driller	Dennis Moore	Geologist	Bill Gordon	
Drilling Co.		ADT-MA Tro	enton, New J	ersey	Pa. Geo. No. PG-001466-0		

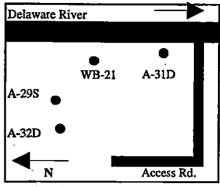
WB-20



				_				;
	Depth (feet BGS)		Well	Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)	Sample Description/Classification
	_		Ĺ				ļ	
·			 			-		<u> </u>
	10		<u> </u>					
Lithologic sa								
split-spoons		_				nism 		
was a 140 pc					•			
Blow counts	were rec	orded p	per 0.	.5 foot	interval.			
The 8.25-inc				dvance	d to 10 ft	bgs.		
with continu	ous split	spoons	i					
							_	
<u> </u>								
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1							<u></u>	
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72208.00.01 Date Completed 24 Aug 98 1) No: R.F.I. Owner Occidental Chemical Corporation oject Bore Depth (ft) Del. City, Del. Diameter 8.25 Location Surface Elev feet msl North Riser Elev feet msl East NA Length (ft) Diameter Screen feet TOC NA Stabilized DTW Slot Size Riser NA Length (ft) Diameter Geologist Bill Gordon **Drilling Method** Driller Dennis Moore **HS Auger** Drilling Co. ADT-MA Trenton, New Jersey Pa. Geo. No. PG-001466-G

WB-21



	Depth (feet BGS)		Well	Construction	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
<u> </u>								Recovery	
		•						per 24"	Description
	0				0.0	50-45	0-2	20/24	0-2" SILT, clayey to sandy, dark brown, with roots,
						49-71			organic-rich.
									2-20" SILT, sandy, medium brown, hard, dry, trace
		_					_		gravel.
	2				0.0	21-22	2-4	8/24	SILT, sandy, med.to dark brown, moist, soft,
						15-8			with trace gravel.
1									
							•		
	4				0.2	5-4	4-6	16/24	0-4" SAND, silty, med. brown, soft, moist.
					_	2-2			4-16" CLAY, silty, black, soft, moist, with abundant
					-				plant material.
	6				11.0	1-i	6-8	24/24	CLAY, silty, black, with abundant plant material.
						1-2			
!						_			
:							-		
					1				
	8				1				
_ 			 -		•	-	-		
	<u> </u>								

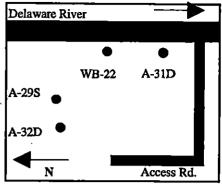
∵⊃ No:	72208.	.00.01				Date C	ompleted	24 Aug 98					
ject	R.F.I.			Owner		Occiden	tal Chem	ical Corporation				•	ŀ
Location	Del. C	ity, Del.		Bore D	epth	(ft)	8	Diameter	8.25		WB-21	A-31D	
North				Surface	e Elev	v	-	feet msl		A-29S			
East				Riser E	lev			feet msl					
Screen		NA		Length	(ft)			_ Diameter	•	A-32D			
Slot Size		NA	$\overline{}$	Stabiliz	zed D	TW		feet TOC	<u> </u>				
Riser		NA		Length	(ft)			Diameter	-	N		Access Rd.	ı
Drilling Me	thod	HS Au	ger	Driller		Dennis N	/loore	Geologist	Bill Gordon	Location Ske	tch Map		
Drilling Co.		ADT-N	MA Trent	ton, Nev	v Jers	sey		Pa. Geo. No	o. PG-001466-G			r	
							_						
			1										
	<u>ه</u> ا		1		Ē.	ë	38)						
	l ĝ			[<u> </u>	.5 f) H		Sample Descripti	ion/Classificatio	n		
	i se		ctio	. E.	ning Sun	er 0	(fee						
) ii		<u> </u>	ima i	2	vs p	ple Die						
	Depth (feet BGS)		Well Construction	Schematic	FLD Keading (FFIM)	Blows per 0.5 feet	Sample (feet BGS)			•		•	
		<u> </u>	ı'							-			
Lithologic s													
it-spoons	(2 inch	x 2 feet). The dr	iving m	echa	nism		ļ					
s a 140 p	ound ha	mmer dr	opped 30)-inches	•				<u> </u>			<u> </u>	
Blow count	s were re	corded p	per 0.5 fo	oot inter	val.								
							•	1					
The 8.25-in	ch I.D.be	orehole v	was adva	nced to	8 ft b	gs.		-					_
with continu	ious spli	t spoons	· ·		_						_		
	<u>-</u>					_		1					
						 		•		·	· ·		_
<u> </u>								 			_		_
								 					
								 					
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		_											_
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			<u> </u>						<u> </u>				
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	-											-	\neg
									-				\neg

WB-21

Delaware River

::0N CX***	72208.00.01	Dat	Date Completed 19 Aug 98						
,∍ject	R.F.I.	Owner Öccio	lental Chem	ical Corporation					
Location	Del. City, Del.	Bore Depth (ft)	10	Diameter	8.25				
North		Surface Elev		feet msl					
East		Riser Elev		feet msl					
Screen	NA	Length (ft)		 Diameter					
Slot Size	NA	Stabilized DTW		feet TOC	-				
Riser	NA	Length (ft)		Diameter					
Drilling Meth	od HS Auger	Driller Denn	is Moore	Geologist	Bill Gordon				
Drilling Co.	ADT-MA T	renton, New Jersey		Pa. Geo. No	. PG-001466-G				

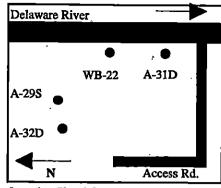
WB-22



· ·	_		Г		r				· · · · · · · · · · · · · · · · · · ·
	Depth (feet BGS)		Well	Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
	_								
ļ								Recovery	<u> </u>
!								per 24"	Description
	0	_			1.0	4-4	0-2	21/24	0-4" SILT, sandy, dark brown.
						7-16			4-21" SAND, silty, med. orange brown to orange,
		_					l		moist, with gravel.
	2	,			5.6	13-6	2-4	14/24	0-4" SAND, silty, medium orange.
						6-6	_	_	4-14" CLAY, silty to sandy, med. red brown,
-									
	4				1.8	4-3	4-6	18/24	0-3" SAND, silty, medium orange.
				_		3-2			3-18" CLAY, silty, dark grey to black, moist.
					-				
			 						
	6				0.8	1-2	6-8	24/24	CLAY, silty, dark grey to black, very soft, moist.
			 			1-2		2-112-7	With plant material.
·			 			1-2			rrani pandi introliti.
<u> </u>	•		<u> </u>						
i			-				··· -		
					0.00		0.10	****	CVAV cite delegant linds
-	8		 		0.5		8-10	24/24	CLAY, silty, dark grey to black, wet.
						1-1			With plant material.
					لـــــــا				

No: 72208.00.01 Date Completed 19 Aug 98 R.F.I. Owner Occidental Chemical Corporation .∌ject Bore Depth (ft) Location Del. City, Del. 10 Diameter 8.25 Surface Elev North feet msl Riser Elev East feet msl NA Length (ft) Screen Diameter NA feet TOC Slot Size Stabilized DTW NA Riser Length (ft) Diameter Geologist Driller Dennis Moore **Drilling Method** HS Auger Bill Gordon

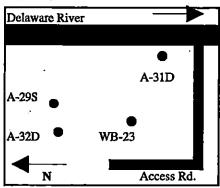
WB-22



Drilling Co. ADT-MA Trenton, New Jersey					Pa. Geo. No. PG-001466-G
Depth (feet BGS)	Well	Schematic PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)	Sample Description/Classification
		<u>, E</u>			
.10					
Lithologic samples split-spoons (2 inch was a 140 pound ha Blow counts were retained to the second split spl	x 2 feet). The d mmer dropped 3 ecorded per 0.5 f orehole was adva	friving mechango-inches.			

72208.00.01 Date Completed 20 Aug 98 TO No: R.F.I. Owner Occidental Chemical Corporation oject Del. City, Del. Bore Depth (ft) Diameter 8.25 Location Surface Elev feet msl North Riser Elev feet msl East NA Length (ft) Diameter Screen feet TOC Stabilized DTW Slot Size NA NA Length (ft) Diameter Riser **Drilling Method HS** Auger Driller Dennis Moore Geologist Bill Gordon ADT-MA Trenton, New Jersey Pa. Geo. No. PG-001466-G Drilling Co.

WB-23



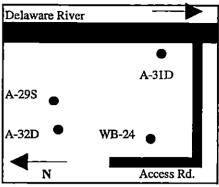
Location Sketch Map

	Depth (feet BGS)		Well	Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
,	•	_						Recovery	<u> </u>
								per 24"	Description
	0				2.0	3-2	0-2	19/24	0-3" SILT, dark brown, organic-rich.
•						2-4			3-19" CLAY, silty, dark brown, hard.
									<u> </u>
	2				1.5	5-3	2-4	24/24	0-10" CLAY, silty, dk brown, abundant plant material.
						3-5			10-24" CLAY, silty, dark grey to black, moist with
									plant material.
	_								
	4				4.0	3-3	4-6	24/24	CLAY, silty, dark grey to black, soft with
		-				3-2			abundant plant material.
<u> </u>									
			_				-		
			 	_	3.6	1-1	6-8	94194	CLAY, silty, dark grey to black, soft, wet.
	6				3.0		U-0	24/24	CLAI, Suly, data gley to black, Sult, wet.
			-			1-1			
·			_						
			ـــــ	<u>-</u>					
-									
	8		<u> </u>	_			L		
		5							·
L									

Enviro	nmei	ntal R	lesot	irc	es Ma	anage	ment			WB-23	
										Delaware Rive	er
ONo:	72208	3.00.01		_		Date C	Completed	1 _ 20 Aug 98			
ject	R.F.I.			Ov	wner	Occiden	tal Chemi	ical Corporation			•
Location	Del. C	City, Del.		Bc	ore Depth	(ft)	8	Diameter	8.25	_ [A-31D
North				Su	ırface Ele	:V		feet msl		A-29S	
East				Ri	iser Elev		feet msl				•
Screen		NA		Le	ength (ft)			Diameter_		A-32D •	WB-23
Slot Size		NA		_ Sta	Stabilized DTW			_ feet TOC		_	
Riser		NA		_	ength (ft)			Diameter	 	N	Access Rd.
Drilling Me	Orilling Method HS Auger		_	riller	Dennis N	Moore	_ Geologist _	Bill Gordon	Location Sketc	:h Map	
Drilling Co.	Orilling Co. ADT-MA Tre			nton,	, New Jer	sey		Pa. Geo. No.	PG-001466-G	_	
ीt-spoons ंड a 140 p	Depth (feet BGS) Samples were collected with standard Schematic Some (2 inch x 2 feet). The driving mechanism To pound hammer dropped 30-inches. Sample (feet BGS)						Sample (feet BGS)	Sa	ample Description	on/Classification	
with continu						<u>.</u>					
With Commi	Tons spr	Tt apoons.	-					 			
											<u> </u>
_											
								 			
					.						
	-										
			 -					 			
								 			
								<u> </u>			

O No: 72208.00.01 Date Completed 24 Aug 98 Occidental Chemical Corporation Owner roject R.F.I. Bore Depth (ft) 8.25 Location Del. City, Del. 8 Diameter Surface Elev feet msl North Riser Elev feet msl East NA Length (ft) Diameter Screen NA Stabilized DTW feet TOC Slot Size Diameter NA Length (ft) Riser Driller Dennis Moore Geologist Bill Gordon **Drilling Method** HS Auger Pa. Geo. No. PG-001466-G Drilling Co. ADT-MA Trenton, New Jersey

WB-24

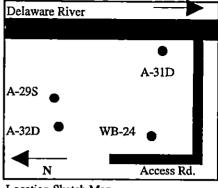


Location Sketch Map

	Depth (feet BGS)		Well	Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
					 	<u> </u>		Recovery per 24"	Description
		<u> </u>	<u> </u>		0.0	7-20	0-2	20/24	SILT, sandy, light brown to orange, with schist fill
	0	'			0.0	22-47	U-2	20124	material and rounded quartz pebbles.
		ļ	-		 	22-41			maieriai and founded quartz perones.
			 		 	 			
			 						
				<u> </u>	0.0	17-10	2-4	6/24	SILT, sandy, light brown to orange, with plant roots.
	2		 	_	- 0.0	5-5		0/24	SIL1, Saidy, light brown to brange, with plant foots.
					-	J-J		,	
			ļ	_	-				
			ļ .—		 				· · · · · · · · · · · · · · · · · · ·
					0.8	3-1	4-6	24/24	0-4" SILT, clayey, med. brown, harder, dry.
	4	_			0.8	 	4-0	24124	
					<u> </u>	2-2			4-24" CLAY, silty, black, soft, moist.
					-				
ļ			_		 				
	-		_		 				
	6		<u> </u>		0.2	3-3	6-8	24/24	CLAY, silty, black, soft, wet, with plant material.
		<u> </u>	<u> </u>		_	3-3			
					<u> </u>				
					<u> </u>		_		
			_						
	8								
						_			

) No: 72208.00.01 Date Completed 24 Aug 98 R.F.I. Owner Occidental Chemical Corporation ∍ject Del. City, Del. Bore Depth (ft) 8 Diameter Location 8.25 Surface Elev feet msl North Riser Elev feet msl East NA Length (ft) Diameter Screen Stabilized DTW feet TOC Slot Size NA Riser ÑΑ Length (ft) Diameter Bill Gordon **Drilling Method** HS Auger Driller Geologist Dennis Moore Drilling Co. ADT-MA Trenton, New Jersey Pa. Geo. No. PG-001466-G

WB-24



	Depth (feet BGS)		Well Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)	Sample Description/Classification
Lithologic sa	ımples v	vere col	lected with	standard			
it-spoons					nism		
			opped 30-ii				
Blow counts	were re	corded p	per 0.5 foot	interval.			<u> </u>
The 8.25-inc	h I.D.bo	rehole v	was advance	ed to 8 ft b	gs.	<u>-</u>	
with continu	ous split	spoons	·				
-					· · ·		
		-					
				_			

ADT-MA Trenton, New Jersey

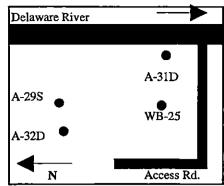
The 8.25-inch I.D.borehole was advanced to 6 ft bgs.

with continuous split spoons.

Drilling Co.

Date Completed 24 Aug 98 72208.00.01 O No: Owner Occidental Chemical Corporation R.F.I. foject Del. City, Del. Bore Depth (ft) 6 Diameter 8.25 Location Surface Elev feet msl North Riser Elev feet msl East NA Length (ft) Diameter Screen NA Stabilized DTW feet TOC Slot Size Diameter NA Length (ft) Riser Geologist Bill Gordon Driller Dennis Moore **Drilling Method** HS Auger Pa. Geo. No. PG-001466-G

WB-25



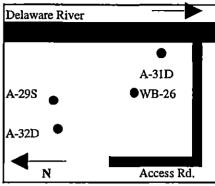
	Depth (feet BGS)		Well	Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
	<u> </u>							_	
								Recovery	
	<u> </u>		_					per 24"	Description
	0	_	ļ <u> </u>		0.0	9-14	0-2	20/24	SILT, clayey, light to med. brown, soft, dry with
	<u> </u>		ļ			13-33			rounded quartz pebbles.
			<u> </u>	[
	_	_	<u> </u>						
	+ -		-		0.2	16-17	2-4	15/24	0-11" SILT, A/A
	2		-		0.2	13-19		13/24	11-15" CLAY, silty, dark grey to black, soft, moist.
			_			13-17			Trace sand.
	- -		 						Hate Sand.
			 						
	4		<u> </u>		0.4	10-9	4-6	24/24	0-8" CLAY, silty, dark grey to black.
	1 -				_	5-9			8-17" SAND, silty, light grey to brown.
	-								17-24" CLAY, black, soft, wet, with plant-material.
		_			-				
	1 1		1		_				
	6					_			
-			1						
thologic	samples we	ere col	lected	with s	standard				
plit-spoon	s (2 inch x	2 feet)). The	drivi	ng mechar	nism			
was a 140	ound ham	mer dr	ropped	1 30-in	ches.		-		
Blow coun	ts were reco	orded	per 0.:	5 foot	interval.	-			·

ADT-MA Trenton, New Jersey

Drilling Co.

Date Completed 20 Aug 98 O No: 72208.00.01 Occidental Chemical Corporation roject R.F.I. Owner Bore Depth (ft) 14 Diameter 8.25 Location Del. City, Del. Surface Elev feet msl North Riser Elev feet msl East NA Length (ft) Diameter Screen feet TOC Stabilized DTW NA Slot Size Diameter NA Length (ft) Riser Dennis Moore Drilling Method **HS** Auger Driller Geologist Bill Gordon

WB-26



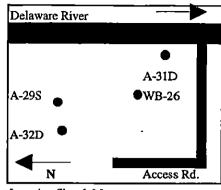
Location Sketch Map

			,						
	Depth (feet BGS)		Well	Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
—	_	ļ	-					Recovery	Description
	<u>·</u>	 	<u> </u>					per 24"	Description
	. 0	<u> </u>	\vdash		2.1	4-14	0-2	16/24	SILT, sandy, tan to lt. brown, dry, hard.
ļ		<u> </u>				24-24		_	
		<u> </u>	<u> </u>						
		<u> </u>	├						
			<u> </u>						
	2	<u> </u>	<u> </u>		1.6		2-4	14/24	SILT, sandy, lt. to med. brown, with rounded qtz.
_			<u> </u>			14-11			pebbles.
		<u> </u>	<u> </u>						
<u> </u>			ļ						
	4				1.9	6-6	4-6	24/24	0-11" SILT, sandy, lt. to med. brown, with gravel,
			<u> </u>			3-5			and schist fill material, some plant material.
		<u></u>						·	-11-24"-CLAY, silty, med. grey to black, soft
	6				11.0	5-3	6-8	24/24	CLAY, silty, med. grey to black, soft, moist.
			Ī .			1-2			
		_				-			
					-				
			T		-				
	8		I^-		1.4	3-3	8-10	24/24	CLAY, silty, med. grey to black, wet.
— —	-	i				2-2			With plant material.
			-	_				-	
		L	<u></u>						

Pa. Geo. No. PG-001466-G

YO No:	72208.00.01		Date Comple	ted 20 Aug 98			
roject	R.F.I.	Owner	Occidental Che	mical Corporation			
Location	Del. City, Del.	Bore Depth	(ft) 14	Diameter	8.25		
North		Surface Ele	v	feet msl			
East		Riser Elev		feet msl			
Screen	NA	Length (ft)		Diameter			
Slot Size	NA	Stabilized I	TW	feet TOC			
Riser	NA	Length (ft)		Diameter			
Drilling Meth	od HS Auger	Driller	Dennis Moore	Geologist	Bill Gordon		
Drilling Co.	ADT-MA Tr	enton, New Jer	sey	Pa. Geo. No	Pa. Geo. No. PG-001466-G		

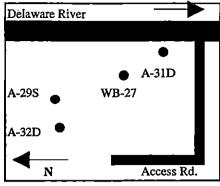
WB-26



	Depth (feet BGS)	Well Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
		-					
	10		3.0	2-2 2-1	10-12	24/24	CLAY, silty, med. grey to black, very soft.
	12		1.0	1-1	12-14	24/24	CLAY, silty, med. grey to black, very soft, wet.
	14						
Y ish alonia so		collected with	otandard				
split-spoons	(2 inch x 2 fe	eet). The driving	ng mechar	nism			
		dropped 30-in ed per 0.5 foot		_			
	h I.D.boreho ous split spoo	le was advance	d to 14 ft	bgs.			···
Circontinu							
						-	

O No:	72208.00.01	Da	Date Completed 17 Aug 98							
Project	R.F.I.	Owner Occ	idental Chem	ical Corporation						
Location	Del. City, Del.	Bore Depth (ft)	12	Diameter	8.25					
North		Surface Elev		feet msl						
East		Riser Elev		feet msl						
Screen	NA	Length (ft)		Diameter						
Slot Size	NA	Stabilized DTW		feet TOC						
Riser	NA	Length (ft)		Diameter						
Drilling Meth	od HS Auger	Driller Den	nis Moore	Geologist	Bill Gordon					
Drilling Co.	ADT-MA T	enton, New Jersey	 	Pa. Geo. No. PG-001466-G						

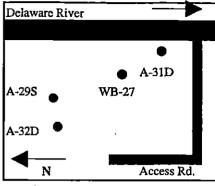
WB-27



					т-				
	Depth (feet BGS)		Well	Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
							<u> </u>	Recovery	
<u> </u>		_				_	<u> </u>	per 24"	Description
	0					16-26	0-2	20/24	0-16" SILT, sandy, light orange brown, hard, dry,
						27-23	ļ	_	with slag and trace pebbles.
		_		_	<u> </u>	1			16-20" SILT, sandy, dark to medium brown, dry, hard.
	<u> </u>		_			1	<u> </u>		<u> </u>
		_	L		<u> </u>	1	<u> </u>	_	
	2		L		(21-23	2-4	17/24	CLAY, silty to sandy, dark brown grey, with quartz
						27-21	<u></u>	,	and slag fill material.
			\Box						
	4	_			(5-5	4-6	18/24	0-16" SAND, silty, med-brown orange, medium to
				-	i -	4-4			coarse grained, soft, moist.
					-				16-18" CLAY, black, silty, micaceous, with plant
					 	 	 	-	material.
			一		+-	 		-	
	6		1-		 	2-2	6-8	18/24	0-8" SAND, silty, medium brown orange, soft,
 	۳		\vdash			1-1	 		with abundant plant material.
			\vdash		 	 		-	8-18" CLAY, silty, black, very soft, moist.
	ļ				 	 	 		,,,,
-					 	 	 - -		
	- 8	-	-		0.0	3-3	8-10	4/24	SAND, silty, light brown, with CLAY, dark grey, soft.
	 °			_	 	 	1 0-10	4/24	Diano, only, ugin viewing with ourse, time groy, soils
			-		 	2-2			
<u>L_</u>	l _	_	L				<u></u>	L	

O No:	72208	3.00.01		Date Completed 17 Aug 98							
jectے۔	R.F.I.		Owner Occidental Che			ical Corporation					
Location	n Del. City, Del.		Bore Dep	oth (ft)	12	Diameter	8.25				
North		 -	Surface E	llev		feet msl					
East	•		Riser Elev	v		feet msl					
Screen		NA	Length (f	t)		Diameter					
Slot Size		NA	 Stabilized	DTW		feet TOC					
Riser		NA	Length (f	t)		Diameter					
Drilling Met	hod	HS Auger	Driller	Dennis Mo	oore	Geologist	Bill Gordon				
Drilling Co.		ADT-MA Tr	enton, New J	ersey		Pa. Geo. No. PG-001466-G					

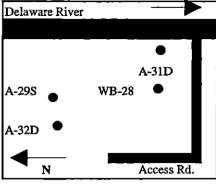
WB-27



		_							
	Depth (feet BGS)		Well Construction	Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
de de			_					_	
:	 -						10.10		,
	10			_	0	1-1	10-12	20/24	CLAY, dark grey to black, micaceous, soft, wet.
	 -					1-2			-
			-						-
	 								
	12								
Lithologic sa									
split-spoons						nism			
was a 140 pc			-			-			
Blow counts	were reco	rded po	ег 0.5	foot	interval.				
The 8.25-inc	h I D base	<u></u>	4.		.d to 10 ft				
with continu				Ance	10 12 11				
With continu	ous spire s _i	poons						<u> </u>	
				- _					
					_			.	
<u> </u>									
				_		_			
								_	

O No:	72208.00.01	Date C	17 Aug 98			
Project	R.F.I.	Owner Occident	tal Chemi	cal Corporation		
Location	Del. City, Del.	Bore Depth (ft)	10	Diameter	8.25	
North		Surface Elev		feet msl		
East		Riser Elev		feet msl		
Screen	NA	Length (ft)		Diameter		
Slot Size	NA	Stabilized DTW		feet TOC		
Riser	NA	Length (ft)		Diameter		
Drilling Meth	od HS Auger	Driller Dennis N	Лооге	Geologist	Bill Gordon	
Drilling Co.	ADT-MA Tr	enton, New Jersey		Pa. Geo. No. PG-001466-G		

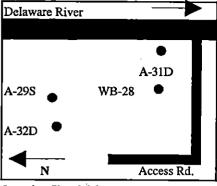
WB-28



	71117-11	110	11011,				T II. GCG.	NO. FG-001400-G
Depth (feet BGS)		Well Construction	Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
			_			_		
					_	 -		
								Description CV To a data along lists are along that the
0				0		0-2	1 //24	SILT, sandy to clayey, light orange brown, hard, dry,
		 	-		18-8	-	-	with trace gravel.
			_		_		_	
		_				_		
2				0	4-4	2-4	12/24	0-2" SAND, silty, light orange brown, dry.
			_		5-5	,		2-12" CLAY, silty, dark brown, soft, with abundant
								plant material (roots), "peat-like".
4				0	2-2	4-6	12/24	0-2" CLAY, silty, dark brown.
	•				1-1			2-12" CLAY, dark grey-blue, very soft.
6				0	1-1	6-8	12/24	CLAY, silty, medium to dark grey, micaceous, with
					1-1			trace medium orange-brown sandy silt.
		_						
8				0.0	1-1	8-10	14/24	CLAY, silty, light to medium grey, micaceous.
					1-1			
	_							
	Depth (feet BGS)	O Depth (feet BGS)	Depth (feet BGS)	Depth (feet BGS) O	Depth (feet BGS) Net and the second of the	0 0 16-27 18-8 2 0 4-4 5-5 4 0 2-2 1-1 6 0 1-1 1-1	Construction Cons	(SS) Comparison of the property of the prop

Drilling Co. ADT-MA Tree			— enton. New J	ersev	Pa. Geo. No	Pa. Geo. No. PG-001466-G			
Drilling Meth	od	HS Auger	— Driller	Dennis Moore	Geologist	Bill Gordon			
Riser	NA		Length (f	t)	Diameter				
Slot Size		NA	Stabilized	idtw	feet TOC				
Screen		NA	Length (f	(t)	Diameter_				
East .			Riser Ele	v	feet msl				
North			Surface E	llev	feet msl				
Location	Del. C	City, Del.	Bore Dep	oth (ft) 10	Diameter _	8.25			
.∉oject	R.F.I.		_ Owner	Occidental Che	mical Corporation				
\O No:	72208	3.00.01		Date Completed 17 Aug 98					

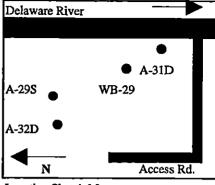
WB-28



Diffing Co.	•	<u>-</u>			110 0010			
	Depth (feet BGS)		Well	Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)	Sample Description/Classification
	10	_	•					
							_	
Lithologic sa	mples w	ere coll	ected	with s	standard		•	
split-spoons (nism		
was a 140 po								
Blow counts	were rec	orded p	er 0.5	5 foot	interval.			-
m	ID.			1	J 45 10 66			
The 8.25-incl				ivance	46 1011	ogs.		
with continue		apoons.			-	_	-	
				<u>-</u>				
		-						
								
								
								
					-			
L				_				

O No:	72208.00.01		Date Completed 17 Aug 98						
غايت	R.F.I.	Owner	Occidental Chem	nical Corporation					
Location	Del. City, Del.	Bore Depti	h (ft) 8	Diameter	8.25				
North	<u> </u>	Surface Ele	ev	feet msl	_				
East	·	Riser Elev		feet msl					
Screen	NA	Length (ft)		Diameter					
Slot Size	NA	Stabilized :	DTW	feet TOC					
Riser	NA	Length (ft)	·	Diameter					
Drilling Meth	nod HS Auger	Driller	Dennis Moore	Geologist	Bill Gordon				
Drilling Co.	ADT-MA Tr	enton, New Je	rsey	Pa. Geo. No. PG-001466-G					

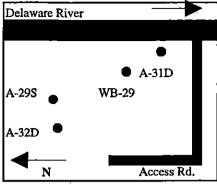
WB-29



	Depth (feet BGS)		Well Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
	1	_				<u> </u>	Recovery	
	1	-					per 24"	Description
	0			0	4-8	0-2	21/24	0-16" SAND, silty, light orange brown, with limestone
					11-15			fill material, and plant material, wood and roots.
<u> </u>					•			16-22" SILT, clayey, light grey, with abundant roots.
-			-					Trace sand and gravel.
	-							
<u>-</u>	2			0	7-8	2-4	14/24	SILT, clayey, light grey, dry, brittle, with abundant
		-			12-15	-		plant roots.
					_			
	4			0	2-2	4-6	14/24	0-2" SILT, clayey, light grey.
				- 4	2-2		17/27	
								2-14" CLAY, mottled medium to light grey to black, soft, with abundant plant material.
	_							sort, with abundant plant material.
	6			0	1-1	6-8	10/24	CLAY, light grey-brown, soft, wet, with plant material.
	- " -			- "	1-3	· · ·	10/24	Cara, ngin gicy-brown, sort, wet, with plant material.
					1-3			
:						_		
	-+			 -				
1	<u>°</u> L						-	
			··				<u> </u>	

(D No:	72208.00.01		Date Comple	eted 17 Aug 98			
.√oject	R.F.I.	Owner	Occidental Ch	emical Corporation	n.		
Location	Del. City, Del.	Bore Depth	(ft) 8	Diameter	8.25		
North -		Surface Ele	v	feet msl			
East -		Riser Elev		feet msl			
Screen -	NA	Length (ft)		Diameter			
Slot Size	NA	Stabilized I	OTW	feet TOC			
Riser	NA	Length (ft)		Diameter			
Drilling Meth	nod HS Auger	Driller	Dennis Moore	Geologist	Bill Gordon		
Drilling Co.	ADT-MA Tr	enton. New Jer	sev	Pa. Geo. N	Pa. Geo. No. PG-001466-G		

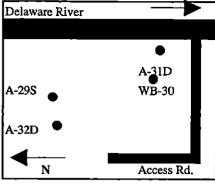
WB-29



	Depth (feet BGS)	Well Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)	Sample Description/Classification
	<u> </u>				· .	
hologic sa	amples were	collected with s	tandard	<u>.</u>		
L'alit-spoons	(2 inch x 2 i	feet). The drivir	ng mechan	nism		
was a 140 pc	ound hamme	r dropped 30-in	ches.			
Blow counts	were record	led per 0.5 foot	interval.			
						<u> </u>
The 8.25-inc	h I.D.boreh	ole was advance	d to 8 ft b	gs.		
with continu	ous split spo	oons.				
				<u>-</u>		
				<u>_</u>		

O No:	72208.00.01		Date Complete	ed 14 Aug 98	
Project	R.F.I.	Owner	Occidental Cher	nical Corporation	
Location	Del. City, Del.	Bore Dep	th (ft) 10	Diameter	8.25
North		Surface E	lev	feet msl	
East		Riser Elev	v	feet msl	
Screen	NA	 Length (f	.)	Diameter	
Slot Size	NA	Stabilized	DŢW	feet TOC	
Riser	NA	Length (ft	:)	Diameter	
Drilling Meth	od HS Auger	Driller	Dennis Moore	— Geologist	Bill Gordon
Drilling Co.	ADT-MA T	 renton, New J	ersey	Pa. Geo. No	. PG-001466-G

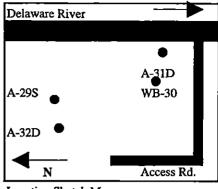
WB-30



	Depth (feet BGS)		Well	Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
	:							Recovery	<u> </u>
						_		per 24"	Description
	0				0	5-15	0-2	20/24	0-10" SILT, sandy, dark brown, humous-rich,
					<u> </u>	17-17			trace schist fill.
				_					10-20"SILT, sandy to gravelly, hard, dry, with
									rounded quartz pebbles.
		_							
	2				0	11-11	2-4	17/24	0-10" SAND, silty, light grey-brown, fine grained,
						15-17			trace gravel, dry.
		-							10-17" SILT, clayey, medium grey, trace gravel, moist.
					_				
						. , ,	'	-	
	4	_			1	7-4	4-6	22/24	0-16" SAND, silty, light to medium grey, medium to
					-	3-2			coarse grained,
-		-			† <u>-</u>				16-22" CLAY, silty, mottled grey to black, soft, moist.
			-						
			-		 		_		
	6				0.1-0.2	2-1	6-8	23/24	CLAY, silty, dark grey to black, soft, moist to wet,
	<u> </u>	-				1-1			with abundant plant material, roots, etc.
		-				<u> </u>	-		
			-				-		
			-		 				
	8		-		0.1	2-1	8-10	16/24	0-8" CLAY, dark grey to black, , soft, with
						2-1			plant material.
·			i	-			-		8-9" SAND, light grey, coarse grained.

₹O No:	72208	3.00.01		Date C	Completed	14 Aug 98	
ect	R.F.I.		Owner	Owner Occidental Che			
Location	Del. C	City, Del.	Bore Depth	(ft)	10	Diameter	8.25
North			Surface Ele	v		feet msl	
East		<u> </u>	Riser Elev			feet msl	
Screen		NA	Length (ft)			Diameter	
Slot Size	_	NA	Stabilized I	TW		feet TOC	
Riser		NA	Length (ft)			Diameter	
Drilling Meth	ıod	HS Auger	Driller	Dennis 1	Moore	Geologist	Bill Gordon
Drilling Co.		ADT-MA T	renton, New Jer	sey		Pa. Geo. No	. PG-001466-G
				<u> </u>			

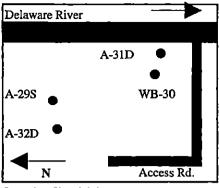
WB-30



	— т						
	Depth (feet BGS)		Well Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)	Sample Description/Classification
							9-16" CLAY, silty, dk brown-grey, with plant material.
	10						
							·
Lithologic sa							
split-spoons					nism ————		
was a 140 pc		-					
Blow counts	were rece	orded p	er 0.5 foot	interval.			
The 8.25-inc	h I D bor	ehole v	ac advance	d to 10 ft	has		
with continu							
- Ten contains		эрооны	<u></u>		_		
-							
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							<u></u>

O No:	72208.00.01		Date Comple	ted 14 A	ug 98		
oject	R.F.I.	Owner	Occidental Che	emical Cor	poration		
Location	Del. City, Del.	Bore Depth	(ft) 8	Di	ameter	8.25	
North -		Surface Elev	·	feet m	sl		
East ·		Riser Elev		feet m	ısl		
Screen	NA NA	Length (ft)		Di	iameter_		
Slot Size	NA NA	Stabilized D	TW	feet TO	oc _		
Riser	NA	Length (ft)			iameter		
Drilling Meth	od HS Auger	Driller	Dennis Moore	Ge	eologist	Bill Gordon	
Drilling Co	ADT-MA Tr	enton. New Jers	ev	Pa.	. Geo. No.	PG-001466-G	

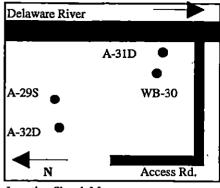
WB-31



	Depth (feet BGS)		Well	Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
			-				-	Recovery	
·								per 24"	Description -
	0				0	"7-17	0-2	22/24	0-17" SILT, sandy, light orange brown, dry, with roots.
						19-21			17-19" CLAY, dark grey brown, brittle, with abundant
		_							plant material.
		-	T		_				19-22" SILT, sandy, light brown, gravelly, with some
			İ				· -		rounded quartz pebbles.
	2	_			0.2	14-9	2-4	9/24	0-6" SILT, sandy, light brown, gravelly.
						7-5	 -		6-9" CLAY, silty, light grey to black.
						_			
	4				0	wt. of	4-6	24/24	CLAY, black, soft, with abundant plant material.
		-				hmmr.			
	===		1		-				
	 		† -						
			⇈		-			· · ·	
	6	_	╁			1-1	6-8	16/24	CLAY, black, soft, pliable, moist to wet.
-	 		╁			1-1			
ļ——		·	\vdash	_					
	 		+	-					
-	 		\vdash				. <u> </u>		
	8		\vdash	-				 	
								 	
 					_			 	
		_							

O No:	72208.	00.01	<u> </u>	Date Completed 14 Aug 98						
roject	R.F.I.		Owner	Occident	ıl Chem	ical Corporation				
Location	Del. C	ity, Del.	Bore Depth (ft)			Diameter	8.25			
North -			Surface Ele	ev		feet msl				
East			Riser Elev			feet msl				
Screen		NA	Length (ft)			Diameter				
Slot Size		NA	Stabilized 1	DTW		feet TOC				
Riser		NA	Length (ft)	· _		Diameter				
Drilling Meth	od	HS Auger	Driller	Dennis M	ооге	Geologist	Bill Gordon			
Drilling Co.		ADT-MA Tr	enton, New Jer	sey		Pa. Geo. No. PG-001466-G				

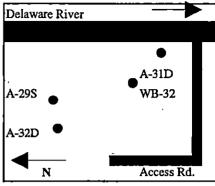
WB-31



¥						
	Depth (feet BGS)	Well Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)	Sample Description/Classification
	· · · · · ·	<u> </u>				
thologic sa	amples were	collected with	standard			
split-spoons	(2 inch x 2	feet). The driving	ng mechai	nism		
was a 140 pc	ound hamme	er dropped 30-in	ches.			
Blow counts	were record	ded per 0.5 foot	interval.		<u> </u>	
		·	_			
		ole was advance	d to 8 ft b	gs,		
with continu	ous split spo	oons.				
						·
	_					
		 -			<u>.</u>	
		<u> </u>	-			
				<u> </u>		
						

Date Completed 17 Aug 98 72208.00.01 O No: Occidental Chemical Corporation Owner R.F.I. _{ு ப}oject Bore Depth (ft) Diameter 8.25 Del. City, Del. Location Surface Elev feet msl North feet msl Riser Elev East Diameter NA Length (ft) Screen feet TOC NA Stabilized DTW Slot Size NA Length (ft) Diameter Riser Geologist Bill Gordon **HS** Auger Driller Dennis Moore Drilling Method Pa. Geo. No. PG-001466-G Drilling Co. ADT-MA Trenton, New Jersey

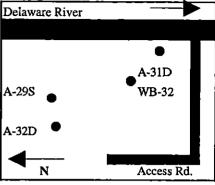
WB-32



	_			_				
	Depth (feet BGS)	Well	Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
				_			Recovery	
i							per 24"	Description
	0			0	12-17	0-2	22/24	0-16" SAND, silty, light orange brown, trace qtz.
					18-23			pebbles, and plant roots.
				<u> </u>				16-22" SILT, clayey, light grey, with abundant roots.
								· Trace sand and gravel.
				ļ.				
	2	 		0	17-16	2-4	22/24	0-10" SAND, silty, light tan orange, moist.
		 			12-11			10-22" CLAY, silty, mottled light grey and orange,
		<u> </u>						with silty and sandy lenses.
			_	ļ				
		 			<u> </u>			
	4			0	2-2	4-6	22/24	0-3" SAND, silty, light grey, moist, trace clay.
					2-2			3-12" CLAY, dark grey to black, soft, moist.
				<u> </u>				
	6			0	1-1	6-8	23/24	CLAY, dark grey to black, soft, wet.
					1-1			
	8							

Date Completed 17 Aug 98 (D No: 72208.00.01 Owner Occidental Chemical Corporation R.F.I. - ject Bore Depth (ft) Diameter 8.25 Location Del. City, Del. Surface Elev feet msl North Riser Elev feet msl East NA Length (ft) Diameter Screen feet TOC NA Stabilized DTW Slot Size Riser NA Length (ft) Diameter Drilling Method HS Auger Driller Dennis Moore Geologist Bill Gordon ADT-MA Trenton, New Jersey Pa. Geo. No. PG-001466-G Drilling Co.

WB-32



Depth (feet BGS)	Well Construction Schematic	PID Reading (PPM)	Blows per 0.5 feet	Sample (feet BGS)	Sample Description/Classification
	<u></u>			_	
hologic samples were co	llected with s	tandard			
it-spoons (2 inch x 2 fee	t). The drivin	ig mechar	iism		
was a 140 pound hammer d	ropped 30-in	ches.			
Blow counts were recorded	per 0.5 foot i	nterval.			
The 8.25-inch I.D.borehole	was advance	d to 8 ft b	gs.		
with continuous split spoon	s.				
			_		
		<u> </u>			
			_		
					
					

WELL BORING LOGS

MONITORING WELLS OXYCHEM DELAWARE CITY FACILITY

	Well	-		TOC	Surface	Screened	Interva		
	Depth	Northing	Easting	Elevation	Elevation	top	from	bottom	to
Well	(ft bgs)			(ft msl)	(ft msl)	(ft bgs)	(ft msl)	(ft bgs)	(ft msl)
B-5	29	582778.1369	441987.7494	19.28	17.09	19	-1.91	29	-11.91
A-6A	19.5	581991.5495	441917.6308	22.22	20.44	9.5	10.94	19.5	0.94
A-7A	19.5	581983.4374	441501.4213	19.87	17.84	9.5	8.34	19.5	-1.66
A-8	19	582266.4191	441992.7368	22.08	19.06	9	10.06	19	0.06
A-12	29	582256.8822	441360.9554	24.97	24.15	19	5.15	29	-4.85
A-13	56	581987.4305	441477.6612	20.59	17.60	46	-28.4	56	-38.4
A-14	21	582295.7741	441887.5534	19.74	17.13	11	6.13	21	-3.87
A-15	49	582432.6221	441757.9952	17.54	14.58	39	-24.42	49	-34.42
A-16	65	582543.1698	441495.8626	25.58	23.89	53	-29.11	63	-39.11
A-17	215	583058.4091	441504.8286		23.70		23.7		23.7
A-18	65	583058.6700	441504.6500	25.50	24.00	53	29	63	-39
A-20	<i>57.</i> 5	583742.4104	441273.4630	8.43	6.40	45	-38.6	55	- 48.6 ୁ
A-23	25	582426.7859	441762.6042	17.48	14.71	0	14.71	0	14.71
A-24	48	582543.1700	441487.4830	26.52	23.98	Ō	23.98	0	23.98
A-25S	36	583361.9594	441940.9770	19.83	17.87	26	-8.13	-36	-18.13
A-25D	52	583358.3544	441934.6944	20.28	17.87	42_	-24.13	52	-34.13
A-26OB	18	582861.6317	441577.9779	27.35	25.34	8	17.34	18	7.34
A-26S	45	582858.7215	441572.9062	27.35	25.59	35	-9.41	45	-19.41
A-26D	69	582856.0578	441577.5078	27.42	25.48	59	-33.52	69	-43.52
A-27S	30	583384.3118	440992.3695	25.48	22.90	20	2.9	30	-7.1
A-27D	65	583377.4542	441990.7000	25.13	22.97	55	-32.03	65	-42.03
A-29OB	20	584503.0954	443057.6182	4.98	2.60	10	-7.4	20	-17.4
A-29S	35	584502.1699	443081.2888	5. <i>7</i> 1	3.24	25	-21.76	35	-31.76
A-29D	60	584490.6459	443071.6365	4.84	3.42	50	-46.58	60	-56.58
A-30OB	18	584199.8085	444145.7624	9.87	7.88	8	-0.12	18	-10.12
A-30D	60	584191.8889	444152.4927	10.03	7.51	45	-37.49	60	-52.49 ⁻
A-31OB	30	583335.4090	444466.8438	18.39	15.79	19.5	-3.71	30	-14.21
A-31D	65	583334.7649	444461.7695	18.79	15.64	54.5	-38.86	65	-49.36

MONITORING WELLS OXYCHEM DELAWARE CITY FACILITY

	Well	_		TOC	Surface	Screened	Interva		
	Depth	Northing	Easting	Elevation	Elevation	top	from	bottom	to
Well	(ft bgs)			(ft msl)	(ft msl)	(ft bgs)	(ft msl)	(ft bgs)	(ft msl)
A-32OB	15	584274.3701	442548.2746	3.00	NA	5	NA	15	NA
A-32S	35	584281.2687	442545.3082	3.00	NA	25	NA	35	NA
A-32D	60	584274.7080	442540.1341	3.00	NA	45	NA	60	NA
A-33S	50	583146.7755	441369.8433	25.95	24.43	35	-10.57	50	-25.57
A-33D	70	583146.8828	441374.7781	26.72	27.08	60	-32.92	<i>7</i> 0	-42.92
A-34S	29	583111.7469	440671.8176	28.74	27.03	19	8.03	29	-1.97
A-34D	42	583111.6878	440677.1628	28.52	27.08	32	-4.92	42	-14.92
A-35S	19	583229.4013	440368.1848	16.21	13.82	9	4.82	19	-5.18
A-35D	40	583229.1585	440360.0068	16.05	13.52	30	-16.48	40	-26.48
A-36S	25	582595.5173	440449.2951	29.85	26.95	15	11.95	25	1.95
A-36D	39	582593.8690	440449.5542	29.78	27.02	29	-1.98	39	-11.98
A-37S	13	583632.4184	442141.4332	6.20	4.63	_ 3	1.63	13	-8.37
A-37D	65	583629.1913	442138.513	6.52	4.70	55	-50.3	65	-60.3
A-38D	56	583562.9564	442060.5302	6.86	5.54	46	-40.46	56	-50.46
A-39OB	21	583197.82	441921.983	22.57	20.52	11	9.52	21	-0.48
A-39S	35	583199.5604	441925.9380	22.43	20.54	25	-4.46	35	-14.46
A-39D	58	583202.3834	441930.5249	22.36	20.19	48	-27.81	58	-37.81
R-110	35.5	583210.3174	442096.4095	18.38	16.39	30.5	-14.11	35.5	-19.11
R-112	35	583151.6824	441658.5334	24.75	22.33	30	-7.67	35	-12.67
A-11A	54	582564.5078	441304.9969	28.43	26.00	NA	NA	NA	NA
ST18S	36	581776.0000	441573.0000	1.00	0.00	14	-14	34	-34
ST18D	<i>7</i> 5	581777.0000	441581.0000	1.00	0.00	63	-63	<i>7</i> 3	-73

Project Name: OxyChem - Delaware City

Project Number: 7462

Client: OxyChem - Glenn Springs

Location: Delaware

Drilling Contractor: ADTMA

Driller: J. Jaworski

Drilling Method: HS Auger

Surface Elevation:

Hole Designation: A-31D

Date Started: 9/15/98 10:00 a.m.

Date Completed:

CRA Supervisor: J. Garges, B. Foulke

i		Locatio	n: Delav	vare	Surface Elevation:	•	CRA Super	V 15UI	; j. G	arges	, D. I	ouike	; I
GE	OPHYSICAL LOG				SAMPLE DESCRIPTION				SAM	PLE I	DET.	ILS	
		L I T	Inte	graphic rvals in ft bgs)	Order of Descriptors:		S M A E		Penet	ratior ord	า	R	, <u> </u>
Na	itural Gamma Log	H	(depuis	in it bgs)	Primary Component/Secondary Components	S	A E M T	Snl	kec it Spo		OTATO	E	
1 144	(CPS)	;;			Relative Density/Consistency, Grain	M	PH	Jpi.	Г	OIL DI	Ows_	0	Р
	(-1-)	L	F	}	Size/Plasticity, Gradation/Structure, Color,	P	Lol					l v	1
1			R		Moisture Content, Supplementary Descriptors	L	I D					E	D
0 1	0 20 30 40 50 60 70	G	0	Т	• • • • • • • • • • • • • • • • • • • •	E	N					R	
0		Y	M	0		#	G	6"	6"	6"	6"	Y	(ppm)
1			0	2	Sand, fine to medium, brown, some silt, little gravel and organic material.	_ 1	Split spoon	9	7	6	6	16"	0
3 —					Same as above for 2 and 3 feet bgs; 4 feet bgs sandy clay, medium								
4 —	 	.	2	4	brown sand and black clay	2	Split spoon	5	5	4	4	16"	0
5 —			i.		Peat (black clay with organic material) with a few lenses of sand					·			
6			4	6	(medium brown) approx. 6 inches . Wet at 5 feet (perched?).	3	Split spoon	1	1	2	2	15'	0
8 —			6	8	Same as above.	4	Split spoon	2	2	2	2	24"	۰0
9 -			8		Same as above.	5	Split spoon	1	1	2	2	24"	0
11 —		1. 1			Peat (black silts, clay with organic material); medium gray to dary gray,							•	
12		15.7	10	12	dry to moist.	6	Split spoon	2	2	1	1	23"	0
13 —		7 a.v.	12	14	Same as above.	7	Split spoon	2	. 2	2	2	0"	
15 -			14	16	Peak (black organic material)	8	Split spoon	1	_2	3	3	14"	0
17		· [16	18	Peat (dark gray and gray clay). Moist. Dry, sand, medium 6-inches from 16-1/2 to 17.	,9	Split spoon	1	3	3	· 2	14"	0
19					0 to 6 inches - peat-clay; 6 to 10 inches - sand medium brown, moist; 10 to					,		-	
20		-	18	20	24 inches - silty clay brown and gray, moist.	10	Split spoon	3	3	3	3	24"	0
21			20	22	0 to 6 inches - coarse sand, gray, trace gravel; 6 to 24 inches - silty clay, brown and gray, moist.	11	Split spoon	3	5	6	7	24"	0
22		1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1	22		0 to 6 inches - peat, dark gray clay; 6 to 8 inches - medium gray sand; 8 to 24 inches- brownish gray silty clay w/some orange silty clay (iron staining). Spoon is wet, but clay portion is dry to moist.		Split spoon		4	5	7	24"	0
24	· · · · · · · · · · · · · · · · · · ·				roundwater Encountered:	+	opin spoon	J	*		'-	27	
		_	-	-	not recorded								
			omments	s: Comp	pletion Details:								ļ
·	CRA												}

STRATIGRAPHIC AND GEOPI AL (OVERBURDEN)

Project Name: OxyChem - Delaware City

Project Number: 7462

Client: OxyChem, Glenn Springs

Location: Delaware City, Delaware

Drilling Contractor: ADT- MidAtlantic, Inc.

Driller: J. Jaworski

Drilling Method: Hollow Stem Auger Surface Elevation: Hole Designati A-31D

Date Start 9/15/98 10:00 a.m.

Date Completed:

CRA Supervisor: J. Garges, B. Foulke

GEOPHYSICAL LOG SAMPLE DESCRIPTION SAMPLE DETAILS												
GEOPHYSICAL LOG	↓ ↓ │		1.	SAMPLE DESCRIPTION		,		SAM	PLE)	DETA	ILS_	
Natural Gamma Log	I T H	Inte	graphic rvals in ft bgs)	Order of Descriptors: Primary Component/Secondary Components	S A	S M A E M T		Rec	ration ord on Bl		R E C	
(CPS)	"			Relative Density/Consistency, Grain	M	PH	201	I Spe	OI DI	OWS	0	Р
(C13)	L	F		Size/Plasticity, Gradation/Structure, Color,	P	L O					l v	I
	ΙöΙ	R		Moisture Content, Supplementary Descriptors	L	I D					Ė	Ď
	Ğ	l ô	Т	Mobile Contain, supplementary Descriptors	E	N					R	
0 10 20 30 40 50 60 70	Y	M	Ō		#	G	6 ⁿ	6"	6"	6"	Y	(ppm)
25 26 27		22	24	0 - 6 inches (Peat-dark gray clay); 6 - 8 inches medium gray sand; 8 - 24 inches brownish gray silty clay with some orange silty clay (iron staining). Split spoon is wet, but clay portion is dry to moist.	12	split spoon	3	4	5	7	24"	0
28 29		24		0 - 24 inch - Reddish-brown and gray silt and silty clay		split spoon		4	6	8	24"	0
30		26	28	0 - 6 inch - Reddish brown and gray silty clay; moist, 6 - 18 inches - medium to coarse gray sand, wet; 18 - 24 inches - Reddish brown and	14	split spoon	5	6	7	7	24"	0
32		28	30	0 - 24 inches - gray silty clay, moist.	15	split spoon	3	7	9	10	24"	Ō
33 34		30	32	0 - 24 inches - gray silty clay, moist.	16	split spoon	6	6	10	9	24"	0
35 36	-1	32	34	0 - 24 inches - gray silty clay, moist; bottom few inches light gray clay; a few inches of fine sand in the middle of spoon, wet.	17	split spoon	7	9	10	14	12"	0
37 38		34	36	0 - 24 inches silty clay, dark gray, low plasticity, dry.	18	split spoon	7	8	8	9	24"	0
39 40		36	38	0 - 24 inches silty fine sand and clay, dark gray. Low plasticity, dry, a few strangers of greenish, micaceous, glauconite, silty clay	19	split spoon	9	11	12	8	24 ^H	0
41 42		38	40	Same as above. Dry.	20	split spoon	12	14	15	17	24"	0
43 44		40	42	Same as above. Wet.	21	split spoon	6	9	13	15	24"	0
45 46		42	44	Same as above. Dry.	22	split spoon	11	15	18	12	24"	0
47	:	44	46	Same as above. Dry.	23	split spoon	3	10	13	15	24"	0
CRA		Notes and Comments	s:	Depth of First Groundwater Encountered: nr - not recorded Completion Details:		·				<u> </u>		

STRATIGRAPHIC AND GEOPH

AL (OVERBURDEN)

Project Name: OxyChem - Delaware City

Project Number: 7462

Client: OxyChem, Glenn Springs

Location: Delaware City, Delaware

Drilling Contractor: ADT-MidAtlantic, Inc.

Driller: J. Jaworski

Drilling Method: Hollow Stem Auger

Surface Elevation:

Hole Designation: A-31D Date Started: 9/15/98 10:00 a.m.

Date Completed: 10/13/98

CRA Supervisor: J. Garges, B. Foulke

	Locatio	on: Delav	vare City,	are City, Delaware Surface Elevation: CRA Supervisor: J. Garges, B. Foulke								
GEOPHYSICAL LOG		11		SAMPLE DESCRIPTION				SAM	PLE I	DETA	ILS	
	L I T	Inte	graphic rvals in ft bgs)	Order of Descriptors:	s	S M A E			ratior ord	ı	R E	
Natural Gamma Log	H			Primary Component/Secondary Components	A	M T	Spl	it Spo	on Bl	ows	С	
(CPS)	0	}		Relative Density/Consistency, Grain	M	P H					0	P
	L	F		Size/Plasticity, Gradation/Structure, Color,	P	L O	ł				V	I
į	0	R		Moisture Content, Supplementary Descriptors	L	I D					E	D
0 10 20 30 40 50 60 70	G		Т		E	N					R	
48	Y	M	0		#	G	6"	6"	6"	6"	Y	(ppm)
49		46	48	Same as above. Dry.	24	split spoon	L	15	16	18	24"	0
51 52		48	50	Same as above. Dry.	ļ			13	16	17	24"	0
53		50	52	Same as above. Dry.	26	split spoon	l <u>.</u> .	8	10	15	24"	0
54		52		0 - 24 inches silty fine sand and clay, dark gray, low plasticity, dry. A few stringers of greenish, micaceous glaucunite silty clay.	27	split spoon	19	21	22	21	24"	0
56 57		54		0 - 24 inches silty fine sand and clay, dark gray, low plasticity, dry. A few stringers of greenish, micaceous glaucunite silty clay.	28	split spoon	4	8	12	16	24"	0
58 59		56		0 - 24 inches silty fine sand and clay, dark gray, low plasticity, dry. A few stringers of greenish, micaceous glaucunite silty clay.	29	split spoon	9	12	15	16	24"	0
60 61 62		58		0 - 16 inches silty fine sand and clay, dark gray, low plasticity, dry. A few stringers of greenish, micaceous glaucunite silty clay. 16 - 24 inches medium, fine white sand - wet.	30	split spoon	8	9	20	33	24"	0
63		60	62	0 - 24 inches Fine-medium white sand - wet.	31	split spoon		11	18	26	24"	0
65		62	1	0 to 12 inches - medium white sand, wet; 12 - 13 inches - medium red sand, wet; 13 - 16 inches - white, silty clay, dry to moist.	32	split spoon	23	30	17	30	16"	0
67		64	66	0 - 6 inches white-clay-high plasticity, moist	33	split spoon	9	11	15	18	6"	0
69		66	67	0 - 3 inches - white clay; 3 - 6 inches - medium coarse white sand; 6 - 12 inches-white clay with gravel, moist.	34	split spoon	4	7	8	10	12"	0
71 72				· · · · · · · · · · · · · · · · · · ·								
/2		Notes	 	Depth of First Groundwater Encountered:	•						-	
		and	•	nr - not recorded								
	7	Comment	s:	Completion Details:								
CRA												

STRATIGRAPHIC AND GEOPE

Project Name: OxyChem - Delaware City

Project Number: 7462

Client: OvyChem - Glenn Springs

Drilling Contractor: ADTMA

AL (OVERBURDEN)

Driller: J. Jaworski

Drilling Method: 6-5/8" HSA

Hole Designation: A-33D

Date Started: 9/18/98

Date Completed:

				n Springs Drilling Method: 6-5/8" HSA		Date Comp						
	Location	: Delaw	are	Surface Elevation:	<u>. </u>	CRA Super	visor	: B. F	oulke	!		
GEOPHYSICAL LOG				SAMPLE DESCRIPTION				SAM	PLE I	DETA	ILS	
Natural Gamma Log	L I T H	Stratig Inter (depths i	rvals	Order of Descriptors: Primary Component/Secondary Components	S A	S M A E M T	·	Penet Rec it Spo	ord		R E C	
(CPS)	O L O	F R		Relative Density/Consistericy, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	M P L	P H L O I D					O V E	P I D
	G Y	O M	T O		E #	G G	6"	6"	6 ¹¹	6"	R Y	(ppm)
0 10 20 30 40 50 60 70		0		0 - 18 inches - Fine-medium brown sand, some silts and gravel, dry.	1	split spoon		21	32	14	18"	0
1 2		2	4	0 to 19 inches - Fine-medium brown sand, moist.	2	split spoon	13	14	16	18	19"	0
3 4 5		4_	6	0 to 19 inches - Fine-medium brown sand, moist.	3	split spoon	8	6	6	9	19"	0.
6		6	8	0 to 20 inches - Fine-medium brown sand, moist.	4	split spoon	9	8	8	6	20"	0
8		8	10	0 to 8 inches - Fine-medium brown sand, moist; 8 to 14 inches - brown, sandy clay with traces of black clay, moist.	5	split spoon	6	6	4	4.	14"	0
9 10		10	12	0 to 10 inches - lenses of dark gray/green sandy clay (Peat), moist; 10 to 20 inches - Dark gray medium sand, with organic material, moist.	6	split spoon	3	3	8	7	20"	0
11 12	3	12	14	0 to 6 inches - same as above; 6 to 24 inches- peat-black silty clay with organic material and medium sand (gray to dark gray), moist.	7	split spoon	8	6	5	5	24"	0
13 14 15		14	16	Same as above.	8	split spoon	5	7	6	7	24"	0
16 17		16		0 to 6 inches - same as above; 0 to 20 inches - increasing sand content, medium sand, dary gray with black silts and clay, moist.	9	split spoon	. 5_	6	7	8	20"	0
18 19	,	18	20	0 to 2 inches - fine-medium sand, dark gray, moist; 2 to 6 inches - same w/ reddish/brown sand layers, moist; to 12 inches - fine sandy clay, w/gray sands and organic material, dry; 12 to 24 inches - sandy clay - layered gray/reddish/brown sand with gray and dark gray clays, dry to moist.		split spoon	10	13	18	20	24"	0
20 21 22		20		0 to 8 inches - same as above; 8 to 12 inches - sandy clay-brown, moist; 12 to 15 inches - sand clay - brown with fine gray sand, wet.	11	split spoon	4	4	4	5	15"	0
22 23 24		22	24	0 to 24 inches - silty, sand and clay, dark gray silts and black clay, moist.	12	split spoon	4	6	8	9	24"	0
		Notes and mments	·	Depth of First Groundwater Encountered: nr - not recorded Completion Details:								
CRA								_				

STRATIGRAPHIC AND GEOPI

AL (OVERBURDEN)

Project Name: Phase II RFI

Project Number: 7462

Client: Occidental Chemical Corporation

Location: Delaware City, Delaware

Drilling Contractor: ADT-MidAtlantic, Inc.

Driller: J. Jaworski

Drilling Method: Hollow Stem Auger

Surface Elevation:

Hole Designation: A-33D

Date Started: 9/18/98

Date Completed:

CRA Supervisor: B. Foulke

1		Location	: Delaw	are City,	Delaware Surface Elevation:	CRA Supervisor: B. Foulke							
r	GEOPHYSICAL LOG				SAMPLE DESCRIPTION		•		SAM	PLE I	DETA	ILS	
r		L	Stratig	raphic									
ı		I	Inter	rvals	Order of Descriptors:		S M	ŀ		ratior	ı	R	
			(depths i	n ft bgs)		S	A E	l _		ord		E	
	Natural Gamma Log	H			Primary Component/Secondary Components	A	M T	Spl	it Spo	on Bl	ows	C	
l	(CPS)	0			Relative Density/Consistency, Grain	M	P H	1			<i>'</i>	0	P
		L	F		Size/Plasticity, Gradation/Structure, Color,	P	L O					V	I
		0	R		Moisture Content, Supplementary Descriptors	L	I D					E	D
ł	0 10 20 30 40 50 60 70	G	0	T		E	N	_,,		611		R	()
] :	24	Y	M	0	0. 70: 1	#	G	6"	6"	6"	6"	Y	(ppm)
1	25		24		0 to 18 inches - sandy clay, fine-medium sand reddish-brown and gray clay, trace of gravel, moist.	13	split spoon	5	7	8	6	18"	0
:	26	i -	1 24		clay, trace of gravel, moist.	-13	spite spoor	 	 -	۳	- ا	10	
1	27		26		0 to 24 inches - silty clay, gray with traces of gravel, moist.	14	split spoon	8	10	13	14	24"	0
	28				0 to 16 inches - same as above, some lenses of brown silty/sand from 14			i					
	29	1 1	28	30	to 16 inches.	15	split spoon	9	12	17	19	16"	0
1	30	1 1			0 to 6 inches- gray sandy clay, moist, trace of gravel; 6 to 18 inches- reddish brown sandy				١.		_		
			30		clay, trace gravel, moist; 18 to 24 inches- black clay w/ gray sand (peat), moist.	16	split spoon	2	.3	4	5	24"	0
	32				0 to 12 inches - black clay and gry sand, moist; 12 to 24 inches - dark gray	45	10		١,	١,	_	O A II	
	33		32		clay and sand, moist.	17	split spoon	3	4	4	6	24"	0
	34		34		0 to 6 inches- dark gray clay, moist; 6 to 20 inches - brown, fine to medium sand, some clay, wet.	12	split spoon	3	4	6	8	20"	0
	36	-	34		0 to 18 inches - brownish gray, sandy clay, little organic material (peat),	-10	spint spoon	۲	-	<u> </u>	۳	20	-
	37	ľ	36		wet.	19	split spoon	7	11	11	9	18"	0
	38				0 to 12 inches - brown and black clay and sand, little organic material, moist; 12 to 18 inches		1		-				
	39		38		tan, med to coarse sand, moist; 18 to 24 inches - brown sandy clay, moist.	20	split spoon		6	6	7	24"	0
	40	Ι Γ	:		Empty, try again;			3	4	6	8	0	0
1	41	{	40		0 - 12 inches - gray and black clay, some organic material, moist; 12 to 18 inches - brownish		1					40	
		1 F	40		gray, medium sand, wet.	21	split spoon	<u> </u>		-	<u> </u>	18	0
	42				0 to 3 inches - brown and gray, medium sand, moist; 3 to 6 inches - gray and black, clay,	i				1			
			42		moist; 6 to 9 inches - black, clay, little organic material, dry; 9 to 24 inches - gray and brown, medium sand, moist (Colombia)	22	split spoon	7	8	9	11	24"	0
	44	T	 -		0 to 3 inches - gray and brown, med. Sand, moist; 3 to 24 inches - Gray	├ 		۲	 	 -			
-	45	1	44		and brown, sandy clay, moist (Colombia)	23	split spoon	7	8	9	14	24"	0
	46				0 to 18 inches - orangish brown and gray, medium to coarse sand, little								
	47		46		gravel, wet (Columbia Fm)	24	split spoon	7	9	11	11	18"	0
1	40		Notes		Depth of First Groundwater Encountered:								
ı		1	and	ļ	nr - not recorded								
Г] c	mments); ;;	Completion Details:								
1	CRA				-								
L	CIVA		[-	<u></u>								

STRATIGRAPHIC AND GEOPE

AL (OVERBURDEN)

Project Name: OxyChem - Delaware City Project Number: 7462

Client: OxyChem - Glenn Springs

Location: Delaware City, Delaware

Drilling Contractor: ADT- MidAtlantic, Inc.

Driller: J. Jaworski

Drilling Method: 6-5/8" Hollow Steam Auger

Surface Elevation:

Hole Designati A-33D

Date Started: 9/18/98 11:00

Date Completed:

CRA Supervisor: J. Garges

		Location	Delaw	are City,	Delaware Surface Elevation:	CRA Supervisor: J. Garges SAMPLE DETAILS							
GEOPHY	SICAL LOG	T			SAMPLE DESCRIPTION				SAM	PLE I	DETA	ILS	
	Gamma Log CPS)	I I T H O L	,	raphic rvals n ft bgs)	Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	S A M P L	S M A E M T P H L O I D		Penet Rec	ord	-	R E C O > E	P I D
0 10 20 3	30 40 50 60 70	G	0	T	·	E	N G	6"	6"	6"	6"	R Y	(mmm)
48 49 50 51		Y	48	O 50	Same as above.		split spoon	7_	9	8	11	18"	(ppm)
52		1	50	52	Same as above.	26	split spoon	3	4	4	7	18"	0
53 54			52	54	Same as above.	27	split spoon	7	9	10	14	24"	0
55 56			54	56	Same as above.	28	split spoon	3	4	5	5	24"	0
57 58			56	58	Same as above.	29	split spoon	10	11	10	11	24"	0
59 60			58	60	Same as above.	30	split spoon	15	12	11	10	24"	0
61 62			60	62	Same as above.	31	split spoon	3	4	7	9	24"	0.
63			62	64	Same as above.	32	split spoon	12	9	8_	6	22"	0
65			64	66	Same as above.	33	split spoon	7	8	11	15	24"	0
67 68			66	68	Same as above, and gravel.	34	split spoon	14	14	26	30	24"	0
69		SERVE.	68	70	0 to 12 inches - same as above; 12 to 24 inches - red, gray, brown, and white clay, dry. (Potomac Formation)	35	split spoon	6	16	19	22	24"	0
71 72			Notes and		Depth of First Groundwater Encountered: nr - not recorded							<u></u>	
С	RA_	Cı	mments	s: 	Completion Details:								

STRATIGRAPHIC AND GEOPH

L (OVERBURDEN)

Project Name: OxyChem - Delaware City Project Number: 7462

Client: OxyChem - Glenn Springs

Drilling Contractor: ADTMA

Driller: J. Jaworski

Drilling Method: 6-5/8" HSA

Hole Designation: A-34D

Date Started: 9/23/98 1430

Date Completed:

Loc	cation: Delaw	are	Surface Elevation:	CRA Supervisor: J. Garges							
GEOPHYSICAL LOG			SAMPLE DESCRIPTION				SAM	PLE I	DETA	ILS	
,	L Stratig	raphic rvals	Order of Descriptors:		s M		Penet	ration		R	
	T (depths i		order of Description	s	A E		Rec			E	
1 '	н 📋		Primary Component/Secondary Components	Α	M T	Spli	it Spo	on Blo	ows	С	
• • • • • • • • • • • • • • • • • • • •	<u> </u>		Relative Density/Consistency, Grain	M	PH					O V	P I
•	L F R		Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	P L	L O I D					E	D
1	G O	Т	Wolsture Content, supplementary Descriptors	E	N					R	
I U 1U 2U 3U 4U 3U BU 7U I	Y M	0		#	G	6"	6"	6"	6۳	Y	(ppm)
		_	0 to 4 inches - gravel and sand, medium, gray, dry; 4 to 24 inches - sand	_	100	2/		20	20	100	
2	0	2	medium, brown, dry.	1	split spoon	26	23	32	30	18"	0
3	2	4	0 to 14 inches - sand medium, brown, dry (fill).	2	split spoon		,			14"	0
4 5			0 to 2 inches - black, sand and gravel; 2 to 12 inches - sand, medium,		· ·						
6	4	6	brown, dry.	3	split spoon	5	6	8	13	12"	0
7			0 to 4 inches - black, sand and gravel (24 ppm on PID), 4 to 12 inches -								24 at 7 feet
8	6	8	sand, medium, brown, dry.	4	split spoon	14	13	13	12	12"	on remainder
9		10	0 to 4 inches - black, sand and gravel; 4 to 12 inches - sand, medium, brown, dry (wet at very)	5	split spoon	2	4	2	8	12"	0
10	1 1		orown, dry (wet at very)	ا	spin spoon			-=-	<u> </u>		
12	10	12	Sand, medium orangish-brown, dry.	6	split spoon	10	11	11	12	12"	0
13	12	14	Sand, medium, organish-brown, moist.	7	split spoon	7	6	7	10	14"	О
15	114						3	3	3	16"	0
16	14	16	Same as above.	8	split spoon	6	3 -	3		10.	
17 18	16	18	Same as above.	9	split spoon	4	6	7	8	15"	0
19	18	20	Same as above.	10	split spoon	6	7	6	8	18"	0
21	20	22	Sand, medium, orangish-brown, wet at 22'bgs (water table)	11	split spoon	5	6	6	7	24"	0
22	20		ound, medium, orangisir-orown, wer at 22 ogs (water table)		Spin spoon	Ť	<u> </u>	\dashv	 -		<u>*</u>
23 24	22	24	Same as above, wet.	12	split spoon	5	6	6	7	24"	0
	Notes		Depth of First Groundwater Encountered:								
	and		nr - not recorded								
OD4	Comments	și.	Completion Details:								
CRA				_	····						

Project Name: Phase II RFI

Project Number: 7462

Client: Occidental Chemical Corporation

Drilling Contractor: ADT- MidAtlantic, Inc.

Driller: J. Jaworski

Drilling Method: Hollow Stem Auger

Hole Designation: A-34D

Date Started: 9/23/98 1430

Date Completed:

	Location	n: Delaw	vare City,	CRA Supervisor: J. Garges SAMPLE DESCRIPTION SAMPLE DESCRIPTION SAMPLE DETAIL								
GEOPHYSICAL LOG	1 1			SAMPLE DESCRIPTION				SAM.	PLE I	DETA	İLS	
] L		graphic				,				77	. [
	I	t .	rvals	Order of Descriptors:	s	S M A E		Peneti Rec		ı ļ	R E	
Natural Gamma Log	T H	(depths	in ft bgs)	Primary Component/Secondary Components	A	M T	Spli	t Spo		ows	Č	
(CPS)	0			Relative Density/Consistency, Grain	M	P H	<u> </u>				0	P
(0.13)	L	F		Size/Plasticity, Gradation/Structure, Color,	P	LO					v	I
	0	R		Moisture Content, Supplementary Descriptors	L	I D					E	D
0 10 20 30 40 50 60 70	G	0	Т		E	N	~ 11	~ "	_,,	Z11	R	
24	Y	M	0		#	G	6"	6"	6"	6"	Y	(ppm)
25 26		24	26	Same as above, wet.	13	split spoon	2	4	6	7	24"	0
27		26	28	Same as above, wet.	14	split spoon	6	7	7	9	24"	0
28		20		Suite do aboye, wea								
29 30	,	28	30	Same as above, wet.	15	split spoon	7	9	10	13	24"	0
31		130	32	Same as above, wet.	16	split spoon	14	17	20	23,	24"	0
32				Same as above, wet (upper 12 inches - tan; lower 12 inches - orangish		*			"			
33 34		32	34	brown; black gravel at 18 to 20 inches)	17	split spoon	7	11	14	19	24"	0
35		34	36	Same as above, wet.	18	split spoon	11	13	15	19	18"	0
36 37		36	38	Same as above, wet	19	split spoon	26	28	35	39	24"	0
38		130	30	Same as above, wet	<u> </u>	opint specifi						
39		38	40	Same as above, wet; (sand and quartz gravel in bottom 6 inches).	20	split spoon	23	25	29	31	24"	0
41		40	42	Sand and quartz gravel at 40 to 41.5 inches; 41.5 to 42 inches - clay brown, light brown (Potomac)		split spoon	13	18	27	35	14"	0
42 43		<u> </u>		0 to 3 inches - clay, brown; 3 to 21 inches - sand and quartz gravel, wet,		•		10	10	44	24"	
44	-	42	44	brown.	22	split spoon	18	12	10	11	24"	0
45 46		44	46	0 to 5 inches - black silty clay - moist; 5 to 24 inches - brown sand	23	split spoon	8	9	12	14	24"	0
47												
48		Notes		Depth of First Groundwater Encountered:	,	<u> </u>	<u> </u>				·	
	_	and		nr - not recorded								
		omment	s:	Completion Details:								
CRA												

Page 1 of 2

STRATIGRAPHIC AND GEOPH L (OVERBURDEN)

Project Name: OxyChem - Delaware City

Project Number: 7462

Client: OxyChem - Glenn Springs

Location: Delaware

Drilling contractor: ADTMA

Driller: J. Jaworski

Drilling Method: 6-5/8" HSA
Surface Elevation:

Hole Designation: A-35D

Date Started: 10/1/98 14:30

Date Completed:

CRA Supervisor: B. Foulke

GEOPHYSICAL LOG				SAMPLE DESCRIPTION	SAMPLE DETAILS					ILS		
	L		graphic	· · · · · · · · · · · · · · · · ·		T						
	I		rvals	Order of Descriptors:		S M		Pene	tration	1	R	
	T	(depths	in ft bgs)		S	A E			cord		E	
Natural Gamma Log	H			Primary Component/Secondary Components	Α	M T		lit Spo	on Bl	ows	C	
(CPS)	0			Relative Density/Consistency, Grain	M	P H					0	P
	L	F		Size/Plasticity, Gradation/Structure, Color,	P	L C					V	I
	0	R		Moisture Content, Supplementary Descriptors	L	I D			ł		E	D
0 10 20 30 40 50 60 70	G	¦o	Т		E	N					R	
0	<u>Y</u>	M	0		#	G	6"	6"	6"	6"	Y	(ppm)
1			_			İ						
2		0	2	Imported crusher run stone and rip-rap 0 to 1 inch - gravel, (ines and moist; 1 to 11 inches - silts and trace clay, low plasticity, moist, brown,				+		<u> </u>		
3				organic material; 11 to 14 inches - black, sandy gravel, wet; 14 to 16 inches - gravel with fines, gray and		 ,	١,		1.0	10	a.c.ii	0
4		2	4	brown, dry.	1	split spoo	n 4	6	12	10	16"	0
5	ļ			0 to 1 inch - gravel with fines, gray and brown, dry; 1 - 15 inches - brown	_	,		,,	_		, _u	0
6		4	6	silt with low clay (low plasticity), dry-moist traces of gray clay, silt.	2	split spoo	n 6	7	7	11	15"	U
7	<u> </u>	6	8	0 to 16 inches - brown silt with increasing amounts of gray silt, dry-moist.	3	split spoo	n 10	111	14	16	16"	0
8				0 to 8 inches - brown silt and gray silt/fine sand, dry-moist; 8 to 14 inches - gray silt, fine		1	_	1				
	1	.		sand, with gravel, dry-moist; 14 to 24 inches - fine sand (brown) with gravel and some		1						
		8	10	reddish/black gravel size pieces of cemented sand (iron deposits) moist.	4	split spoo	n 8	9	13	16	24"	0
10				0 to 4 inches - fine-medium brown sand w/gravel, wet, trace clay; 4 to 8 inches - fine-								•
11				medium brown sand and clay, wet, good plasticity; 8 to 10 inches - fine-medium brown	_	!	١.	_	١.			
12		10	12	sand, wet.	_5_	split spoo	n 3	2	2	5	10"	0
13				0 to 18 inches - fine-medium brown sand and clay, good plasticity, wet;	_			_	l _	_		_
14		12	14	18 to 24 inches - well graded fine-medium brown sand, wet.	6	split spoo	n 4	5	7	9	24"	0
15				0 to 20 inches - fine-medium sand, brown w/lenses of fine-medium sand		1		İ				
16		14	16	and clay, wet.	7	split spoo	n 4	5	6	10	20"	0
17	'	1		0 to 2 inches - same as above; 2 to 8 inches - same as above w/gravel size pieces of cemented								
18			۱	sand (black w/reddish staining); increasing clay, wet; 8 to 16 inches - fine sand brown and		ļ ,,,		١.	_	_	4.00	
		16	18	clay, good plasticity, wet.	-8	split spoo	n 7	4	6	8	16"	0
19		18	20	0 to 24 inches - fine-medium brown sand, traces of gravel, wet.	9	split spoo	n 7	11	11	14	24"	0
21		1	 	0 to 18 inches - same as above; 12 to 18 inches - contained pieces of				+	+	ᢡ	 -	
		20	22	cemented sand, reddish/burnt orange and black, wet.	10	 split spoo	n 2	3	6	8	18"	0
22		1 20		0 to 12 inches - same as above; 12 to 18 inches - brown and		12P*** 3POC	`` 	+ -	 -	Ť		
23		22	24	reddish/orange sand with gravel, wet; 18 to 24 inches - medium, brown	11	 split spoo	n 7	9	10	13	24"	0
24	-	Notes		Depth of First Groundwater Encountered:		12Pitt 3Pot			1 10	1 10	<u></u>	
		and	I	nr - not recorded								
	1 .	Comment	r.	Completion Details:								
OF 1	`	Commend	5.	Completion Details:								
CRA												
CRA 1001/29/FORM SP-03		- i		<u> </u>								

STRATIGRAPHIC AND GEOPH L (OVERBURDEN)

Project Name: Delaware City

Project Number: 7462

Client: OxyChem-Glenn Springs

Drilling Contractor: ADT- MidAtlantic, Inc.

Driller: J. Jaworski

Drilling Method: Hollow Stem Auger

Hole Designation: A-35D

Date Started: 10/1/98

Date Completed:

	Location:	_! Delawa	are City,	Delaware Surface Elevation:		CRA Super	visor	: B. F	oulke	2		ĺ	
GEOPHYSICAL LOG				SAMPLE DESCRIPTION				SAM	PLE I	DETA	ILS	$\overline{}$	
	L I T (d	Stratigra Interview in	vals	Order of Descriptors:	s	S M A E	:	Penet: Rec		ı	R E	ı İ	
Natural Gamma Log (CPS)	НО		,	Primary Component/Secondary Components Relative Density/Consistency, Grain	A M	M T P H	Spl	it Spo	on Bl	ows	C 0	P	
0 10 20 30 40 50 60	L O G	F R	Т	Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	P L È	L O I D N	,		i		V E R	D	
24	Y	М	0		#	G	6"	6"	6"	6"	Y	(ppm)	
25 26		24		0 to 24 inches - fine-medium brown sand, wet, few pieces of stones Same as above, very little gravel/stones except one piece approx. 1 inch	12	split spoon	4	7	2	4	24"	0	
27 28		26		in size of cemented sand, black/reddish/orange at 12 inches.	13	split spoon	4	7	5	6	24"	0	
29 30		28	30	0 to 24 inches - fine-medium brown sand, well graded, wet.	14	split spoon	7	10	10	15	24"	0	
31 32	_	30		Same as above,	15	split spoon	4	8	13	21	24"	0	
33 34	-	32	34	0 to 22 inches same as above; 22 to 24 inches - fine-medium brown sand, gravel-cemented pieces of sand black/burnt orange/reddish and some quartz gravel, wet. 0 to 22 inches - fine-medium brown sand, wet; 22 to 24 inches - some	16	split spoon	23	15	8	10	24"	0	
35 36	_	34		gravel (quartz), fine-medium brown sand, wet.	17	split spoon	6	5	8	10	24"	0	
37 38		36		No recovery - some clay on the end of the spoon 0 to 4 inches - fine-medium-brown sand, wet; 4 to 16 inches - gray and	18	split spoon	6	5	8	13			
39 40		38		red clay, Potomac, moist.	19	split spoon	4	6	10	15	16"	0	
41 42	-	 											
43 44 4					_		_			_			
45 46 47	_				_		· · ·			_			
47 48	1	Notes											
		and mments:		nr - not recorded Completion Details:									
CRA	_		_	•	·					ı			

STRATIGRAPHIC AND GEOPF ___AL (OVERBURDEN)

Project Name: OxyChem - Delaware City

Project Number: 7462

Client: Occidental Chemical Corporation

Location: Delaware City, Delaware

Drilling Contractor: ADT- MidAtlantic, Inc.

Driller: J. Jaworski

Drilling Method: Hollow Stem Auger

Surface Elevation:

Hole Designation: A-36D

Date Started: 10/13/98

Date Completed: 10/13/98 CRA Supervisor: B. Foulke

	Locati	J1.1 2 C14.1	raic City,	SAMPLE DESCRIPTION SAMPLE DETAILS								
GEOPHYSICAL LOG		1		SAMPLE DESCRIPTION				SAM	PLE 1	DETA	ILS	
	L	Stratig	graphic						_		_	
	I	Inte	ervals	Order of Descriptors:		S M		Penet	ration	1	R	
	T	(depths	in ft bgs)		s	A E		Rec	ord		E	
Natural Gamma Log	H	<u> </u>		Primary Component/Secondary Components	A	M T	Spli	it Spo	on Bl	ows	С	I
(CPS)	0			Relative Density/Consistency, Grain	M	PН			ĺ		0	Р
) i	L	F		Size/Plasticity, Gradation/Structure, Color,	P	LO		ŀ			V	I
1	0	R		Moisture Content, Supplementary Descriptors	L	I D					E	D
0 10 20 30 40 50 60 70	G	O	[т		E	N					R	J
0	Y		0		#	G	6"	6"	6"	6"	Y	(ppm)
1		0	2	0 - 2" gravel and sand, fine, black, moist.	1	split spoon	1	3	4	3	16	0
2				2 - 16" sand, medium, brown, moist (COLUMBIA FORMATION).	<u> </u>							
3 4		2	4	0 - 15" sand, medium, brown, moist.	2	split spoon	4	3	3	4	15	0
5		4	6	0 - 10" gravel and sand, medium, brown, moist.	3	split spoon	4	7	8	11	10	0
7 8		6	8	0 - 16" sand, medium, orange-brown, moist. (sand becoming finer and lighter in color with depth)	4	split spoon	7	9	10	11	16	0
9		8	10	0 - 12" sand, fine to medium, tan, trace black spots, moist.	5	split spoon	4	5	б	9	12	0
11		10	12	0 - 20" same as above. 20 - 22" sand, fine, orange-brown, trace iron deposits, moist.	6	split spoon	11	3	6	3	22	0
12		12	14	0 - 10" same as above.	7	split spoon	4	6	6	7	24	Ö
13			**	10 - 24" sand, fine, tan and orange, moist.		opin spoon	•	ľ		′		Ĭ
14 15		14	16	0 - 16" same as above.	8	split spoon	7	6	7	8	16	0
16 17		16	18	same as above.	9	split spoon	nr	nr	nr	nr	nr	nr
18 19		18	20	same as above.	10	split spoon	nr	nr	nr	nr	nr	nr
20 21		20	22	0 - 18" same as above, wet, water at 20.5' bgs.	11	split spoon	4	7	9	10	18	0
22 23		22	24	0 - 24" same as above.	12	split spoon	4	6	6	8	24	0
24		Notes and Comment	s:	Depth of First Groundwater Encountered: 20.5' bgs nr - not recorded Completion Details: 0 - 29', 4" PVC casing; 29 - 39', 4" PVC 10-slot scree	en.						•	
CRA												

STRATIGRAPHIC AND GEOPH. AL (OVERBURDEN)

Project Name: OxyChem - Delaware City

Project Number: 7462

Client: Occidental Chemical Corporation

Location: Delaware City, Delaware

Drilling Contractor: ADT- MidAtlantic, Inc.

Driller: J. Jaworski

Drilling Method: Hollow Stem Auger

Surface Elevation:

Hole Designation: A-36D

Date Started: 10/13/98

Date Completed: 10/13/98 CRA Supervisor: B. Foulke

1	Locani	DII: Delav	vare City,	Delaware Surface Elevation:	-	CKA Super	VISUI	. D. I	ouik			ţ
GEOPHYSICAL LOG			-	SAMPLE DESCRIPTION				SAM	PLE I	DETA	ILS	
	L I T	Inte	graphic ervals in ft bgs)	Order of Descriptors:	S	S M A E			ration	າ	R E	
Natural Gamma Log	H	(depuis	III II bgs)	Primary Component/Secondary Components	A	M T	Sn1		oru on Bl	OWE	C	
(CPS)	0			Relative Density/Consistency, Grain	M	P H	Up.	Γορο		J 11 3	o	P
` ′	L	F		Size/Plasticity, Gradation/Structure, Color,	Р	L O		Ì			v	I
	0	R		Moisture Content, Supplementary Descriptors	L	I D					E	D]
0 10 20 30 40 50 60 70	G	0	Т		E	N					R	
24	Y	M	0		#	G	6"	6"	6"	6"	Y	(ppm)
25 26		24	26	0 - 24" sand, fine, tan and orange, wet.	13	split spoon	<u> </u>	3	4	7	24	0
27 28		26	28	same as above.	14	split spoon	nr	nr	nr	nr	nr	nr
29		28	30	same as above.	15	split spoon	nr	nr	nr	nr	nr	nr
31		30	32	0 - 15" sand, fine to medium, brown, little quartz and mica fragments, wet.	16	split spoon	5	6	6	8	15	0
32 33		32	34	0 - 24" same as above, trace gravel.	17	split spoon	6	8	11	9	24	0
34 35 36		34	36	same as above.	18	split spoon	nr	nr	nr	nr	nr	nr
36 37 38		36	38	same as above.	19	split spoon	nr	nr	nr	nr	nr	nr
39		38	40	0 - 8" sand, fine to med., brown and gravel. 8 - 12" med. to course and gravel, iron staining, 12 - 14" silty clay, black.	20	split spoon	16	15	11	10	14	0
41 42		40	42	0 - 18" sand, fine to medium, brown, wet. 18 - 24" silty clay, greenish-black, trace mica, moist.	21	split spoon	11	5	6	5	24	0
43		42	44	0 - 20" wash. 20 - 24" silty clay, greenish-black, trace mica, moist.	22	split spoon	12	12	13	16	24	0
45		44	46	same as above.	23	split spoon	nr	nr	nr	nr	nr	nr
47 48		46	48	same as above.	24	split spoon	nr	nr	nr	nr	nr	nr
10		Notes and Comments	5:	Depth of First Groundwater Encountered: 20.5' bgs nr - not recorded Completion Details: 0 - 29', 4" PVC casing; 29 - 39', 4" PVC 10-slot scree	יווי							
CRA					-4 11							ļ

STRATIGRAPHIC AND GEOPF AL (OVERBURDEN)

Project Name: OxyChem - Delaware City

Project Number: 7462

Client: Occidental Chemical Corporation

Location: Delaware City, Delaware

Drilling Contractor: ADT- MidAtlantic, Inc.

Driller: J. Jaworski

Drilling Method: Hollow Stem Auger

Surface Elevation:

Hole Designation: A-36D

Date Started: 10/13/98

Date Completed: 10/13/98
CRA Supervisor: B. Foulke

1	Location	n: Delay	ware City,	Delaware Surface Elevation:		CKA Super	VISO	: B. I	ouik			
GEOPHYSICAL LOG			-	SAMPLE DESCRIPTION				SAM	PLE I	DETA	ILS	
	LI		graphic ervals	Order of Descriptors:		S M		Penet	ration	1	R	
	Т	(depths	in ft bgs)	•	S	AE		Rec	ord		E	
Natural Gamma Log	.H			Primary Component/Secondary Components	Α	M T	Spl	it Spo	on Bl	ows	C	
(CPS)	0			Relative Density/Consistency, Grain	M	P H					0	P
	L	F		Size/Plasticity, Gradation/Structure, Color,	P	L O					V	I
	0	R		Moisture Content, Supplementary Descriptors	L	I D					E	D
0 10 20 30 40 50 60 70	G	0	T		E	N					R	, ,
48	Y	M 48	O 50	0.04%	# 25	G	6" 8	6"	6" 19	6" 22	Y 24	(ppm)
49		48	50	0 - 24" sand, fine, tan and orange, wet.	25	split spoon	8	11	19	22	24	"
51		50	52	0 - 18" same as above.	26	split spoon	9	8	15	13	18	0
53		52	54	0 - 24" silty clay, greenish-black, with fine pieces of mica, dyr to m POTOMAC FORMATION		split spoon		17	17	24	24	0
55 56		54	56	0 - 6" same as above. 6 - 24: clay, reddish-brown and gray, dry to moist.	28	split spoon	5	-8	18	17	24	.0
57									-			
59 60									 			
61 62	-	<u> </u>		- · · · · · · · · · · · · · · · · · · ·			-			-		
63 64	-			· · · · · · · · · · · · · · · · · · ·	_	<u> </u>	_					
65 66												
67				·-							 	ļ <u>,</u>
69	i											} '
70	1 -	1	\vdash			 			+	$\vdash \vdash \vdash$	 -	-
71 72											.).
/2 		Notes and	ĺ	Depth of First Groundwater Encountered: 20.5' bgs nr - not recorded	•							
	- c	omment	s:	Completion Details: 0 - 29', 4" PVC casing; 29 - 39', 4" PVC 10-slot scree	n.							
CRA												

STRATIGRAPHIC AND GEOPH L (OVERBURDEN)

Project Name: OxyChem - Delaware City
Project Number: 7462

Client: OxyChem - Glenn Springs

Drilling Contractor: ADTMA

Driller: J. Jaworski

Drilling Method: HS Auger

Hole Designation: A-37D

Date Started: 10/8/98 12:00 pm

Date Completed:

		n: Delay	m - Glen	Surface Elevation:		CRA Super					
	Locatio	III Delav	ware		Ξ	CKA Super			<u> </u>		-
GEOPHYSICAL LOG	↓ . [SAMPLE DESCRIPTION	_			SAM	PLE I	ETAILS	_[`
	I T	Inte	graphic ervals in ft bgs)	Order of Descriptors:	s	S M A E	I	eneta Rec	ration	RE	
Natural Gamma Log	h	(depuis	Itti ogaj	Primary Component/Secondary Components	A	M T	Spli		oru on Blo		
(CPS)	0			Relative Density/Consistency, Grain	in	P H		T T		~~~ o	P
` ,	L	F		Size/Plasticity, Gradation/Structure, Color,	P	L O			į	l v	I
	0	R		Moisture Content, Supplementary Descriptors	L	I D		Ì		E	D
0 10 20 30 40 50 60 70	G	0	T		E	N		l		R	1
0	Y	M	0		#	G	6"	6"	6"	6" Y	(ppm
1 2		0_	2	Orange-brown, medium sand, little coarse sand and gravel.	_1	split spoon	no co	unts due	to heavy	rain on 10/8	PID not o
3 4		2	4	Same as above.	2_	split spoon	no co	unts due	to heavy	rain on 10/8	
5 6		4	6	Same as above.	3	split spoon	no co	unts due	to heavy	rain on 10/8	<u> </u>
7		6	8	Same as above; 7-1/2 inches - Gray, medium sand, moth ball odor	4	split spoon	l	!	I	1	Ì
8	1 1		<u> </u>	8 to 9 inches - Gray, medium sand, moth ball odor; 9 to 10 inches -	╅╧	Бристроси	no co	ints aue	to neavy	rain on 10/8	-
o l		8	10	orangish-brown, medium sand, odor.	5	split spoon	no co	ınts due	to heavy	rain on 10/8	
1 2		10	12	Orange-brown, medium sand, odor	6	split spoon	no coi	anta due	to heavy	rain on 10/8	
3		12	14	Sandy clay, brown, gray, orangish-brown (1,000 ppm on PID)	7	split spoon	no cour	its due lo	heavy to	101 on 24	
5	-	14	16	Sandy clay, gray (100 to 300 ppm on PID)	8	split spoon	no cour	its due to	heavy t	24'	
7 8		16	18	Same as above, up to 150 ppm	9	split spoon	no cour	its due to	heavy 1	10'	1
9		18		Same as above, up to 100 ppm Same as above, dark gray greenish Mica, up to 100 ppm (Mica flakes,	10	split spoon	no cour	its due (d 10/	heavy ra	12"	
2		20		greenish tint (Merchantville?)	11	split spoon		light r	ain on		<u> </u>
3		22	24	Same as above, dark gray up to 100 ppm	12	split spoon	па со	unts due	to light 1	ain 12"	
		Notes and	l	Depth of First Groundwater Encountered: nr - not recorded							
	؍ ⊦	omment	e.								
CRA		omment	.	Completion Details:	_						

STRATIGRAPHIC AND GEOPH Link (OVERBURDEN)

Project Name: OxyChem - Delaware City Project Number: 7462

Client: Occidental Chemical Corporation

Drilling Contractor:	ADT- MidAtlantic, Inc.
Dimming Continuous	TIDE TO MAINTENANCE, THE

Driller: J. Jaworski

Drilling Method: Hollow Stem Auger

Hole Designation: A-37D

Date Started: 10/13/98

Date Completed: 10/13/98

GEOPHYSICAL LOG L Stratigraphic I Intervals Order of Descriptors:		·	5	SAMP	PLE D	TAT	Tς	
		·	T					
T (depths in ft bgs)	S	S M A E	P	enetra Reco			R E	
Natural Gamma Log H Primary Component/Secondary Components (CPS) O Relative Density/Consistency, Grain	A	1	Split	Spoo	n Blo	ws	С	P
L F Size/Plasticity, Gradation/Structure, Color,	P	LO					v	I
O R Moisture Content, Supplementary Descriptors O 10 20 30 40 50 60 70 G O T	L	1					E R	D
Y M O	#.	G	6"	6"	6"	6"	Y	(ppm)
Sandy clay, dark gray, up to 300 ppm (Mica flakes, greenisl "Mechantville?"	h tint,	3 split spoon	over 2	2,000 p p	pm in l	nole	24"	
27 28 Same as above, up to 40 ppm	14	split spoon	no cou	unts due I	to light :	rain	20"	
29 30 Same as above, up to 30 ppm	15	split spoon	no cou	unts due t	to light r	rain	18"	
31 32 30 32 Sandy clay, dark gray and greenish gray, mica flakes, dry.	16	split spoon	no cou	unts due t	to light r	rain	24"	60*
33 34 Same as above.	17	split spoon	no cou	anto due 1	to light r	rain	24"	50*
35 36 Same as above; (white clay last 4 inches of spoon)	18	split spoon	no cou	units due (to light r	rain	24"	20
37 Sandy clay, dark gay to greenish gray (0-12"), white (12-24" 38 stringer at 18-20", dry.	"); 2-inch sand 19	split spoon	no cou	unts due l	to light r	rain	24"	45
39 40 Same as last spoon; may be some interval.	20	split spoon	no cou	ants due 1	to light r	rain	24"	13
41 40 42 Fine to medium sand, white to off-white (buff), moist.	21	l split spoon	no cou	ınts due t	to light r	rain	22"	5
43 44 Same as above; (Magothy or upper Potomac sands, not UH	IZ). 22	2 split spoon	no cou	ınts due t	to light r	rain	24"	20
45 46 Same as above.	23	split spoon	no cou	ınts due t	to light r	qin	24"	10
Same as above (0-18"); 1/2 inch layer of gravel (angular) w, 46 48 staining, (18-1/2-24"), medium sand, white, tan, brown w/		split spoon	no cou	ınts due t	to light r	ain	24"	10
Notes and nr - not recorded								
CRA Comments: Completion Details:								

STRATIGRAPHIC AND GEOPH

Project Name: OxyChem - Delaware City
Project Number: 7462

Client: OxyChem - Glenn Springs

Drilling Contractor: ADT- MidAtlantic, Inc. Driller: J. Jaworski

L (OVERBURDEN)

Drilling Method: 6-5/8" Hollow Stem Auger

Hole Designati A-37D

Date Started: 10/8/98 12:00 pm

Date Completed:

1			City, Delaware	Surface Elevation: 6-5/8" Hollow 8	Stem Auger	,	CRA Super			arges	5		
GEOPHYSICAL LOG				SAMPLE DESCRIPTION			-		SAM	IPLE I	DETA	ILS	
Natural Gamma Log (CPS) 0 10 20 30 40 50 60 70	L I T H O L O G	1 1	Order of Dopes Primary Co Relative De Size/Plastic	:		S A M P L E #	S M A E M T P H L O I D N G		Penet	tration	n	R E C O V E R	P I D (ppm)
49 50		48 5	0 Medium sand, wh	hite, tan, brown, wet.		25	split spoon		counts du		<u> </u>	11"	10
51 52		50 5	2 Same as above.			26	split spoon	no c	counts du	e to light	t rain	13"	7
53 54 55	-	52 5	4 Same as above.			27	split spoon	no c	counts du	e to light	t rain	7"	3
56 57		54 5	6 Same as above.			28	split spoon	no c	counts du	e to light	rain	21"	25
58 59	 -		8 Same as above.			29	split spoon	no c	counts du	e to light	i rain	18"	20
60 61	-	58 6					split spoon	no c	counts du	e to light	rain	12"	20
62		60 6	2 Same as above.			31	split spoon	no c	counts du	e to light	rain	12"	10
65 66			•										·
67 68													
70				····					_				
71 72		Notes	Depth of First C	Groundwater Encountered:						<u> </u>			
CRA	Co.	and mments:	nr - not recorde Completion De	ed									

STRATIGRAPHIC AND GEOPH: AL (OVERBURDEN)

Project Name: OxyChem - Delaware City Project Number: 7462

Client: OxyChem - Glenn Springs

Location: Delaware

Drilling Contractor: ADTMA

Driller: J. Jaworski

Drilling Method: 6-5/8" HSA

Hole Designation: A-38D

Date Started: 10/5/98 10:00

Date Completed:

	Location	on: Delay	ware	Surface Elevation:	-	CRA Super	visoı	: B. F	oulke	!		
GEOPHYSICAL LOG				SAMPLE DESCRIPTION				SAM	PLE I	DETA	AILS	
	L I T	Inte	graphic ervals in ft bgs)	Order of Descriptors:	S.	S M A E		Penet Rec	ration	ı	R E	
Natural Gamma Log	H	-		Primary Component/Secondary Components	A	M T	Spl	it Spo		ows	c	
(CPS)	0			Relative Density/Consistency, Grain	M	P H					0	P
	L	F		Size/Plasticity, Gradation/Structure, Color,	P	L O					V	I
	0	R] _	Moisture Content, Supplementary Descriptors	L	I D					E	D
0 10 20 30 40 50 60 70	G	0	T		E	N]			R	
0	Y	M	0	0 to 2 inches - roots and organic material, dry; 2 to 18 inches - fine	#	G	6"	6"	6"	6"	Y	(ppm)
		o	2	reddish/brown sand, dry.	1	split spoon	4	5	8	10	18"	0
2 3				0 to 10 inches - fine brown sand, wet at 5" (43 ppm in wet soil), water at	┢╧	spitt spoort	-		-	10	10	
3 4		2	4	4'bgs	2	split spoon	6	4	2	2	10"	43
5	1					1	_		=			
		4	6	0 to 11 inches - fine brown sand, trace of gravel, wet.	3	split spoon	1	1	1	1	11"	65
7				0 to 4 inches - fine brown sand, trace of gravel, wet (10 ppm); 4 to 8			-					
8		6	8	inches - dark brown silty sand, wet (24 ppm); 8 to 12 inches - fine brown	4	split spoon	1	1	1.	1	12"	24
	1 .				_							
10	! .	8	10	0 to 8 inches - medium-brown sand, wet (21 ppm)	5	split spoon	1	1	4	6	8 ¹¹	21
11 12	İ	10	12	Brown, medium sand, wet.	6	split spoon	5	6	10	13	17"	10
13				Medium sand, brown, trace of gravel, wet; 3 ppml vinyl chloride	Ť			<u> </u>		10		
13		12		(Draeger Tube) inside augers	7	split spoon	11	13	17	19	24"	9
15		,		Medium sand, brownish/burnt orange, traces of gravel; 0 to 6 inches - 10		A						
16		14	16	ppm; 6 to 18 inches 0 ppm	8	split spoon	8	11	23	20	18 ¹¹	10
17		16	18	Brown, medium sand, wet, traces of gravel.	9	split spoon	9	16	19	23	24"	23
18				0 to 22 inches - brown, medium sand, wet, traces of gravel; 22 to 24 inches		spin spoor		10	15	23	.24	23
19 20		18	20	- medium-coarse sand and gravel, wet (467 ppm)	10	split spoon	10	11	13	12	24"	467
20 21				0 to 3 inches - brown, silty clay, moist (560 ppm); 3 to 14 inches - olive	 -	9,500,000						
22		20		gray/burnt orange layers silty clay, moist (1567 ppm)	11	split spoon	3	3	3	6	14"	1567
23						<u> </u>						
24		22	24	0 to 24 inches - dark gray, silty clay, moist.	12	split spoon	3	5	6	7	22"	210
<u>l</u>		Notes		Depth of First Groundwater Encountered:								
	4	and		nr - not recorded								
	'	Comment	5:	Completion Details:								ŀ
CRA	1											
	·											

STRATIGRAPHIC AND GEOPH"

L (OVERBURDEN)

Project Name: OxyChem - Delaware City

Project Number: 7462

Client: Occidental Chemical Corporation

Location: Delaware City, Delaware

Drilling Contractor: ADT- MidAtlantic, Inc.

Driller: J. Jaworski

Drilling Method: Hollow Stem Auger

Surface Elevation:

Hole Designation: A-38D

Date Started: 10/5/98

Date Completed:

CRA Supervisor: B. Foulke

ı		Locatio	on: Delav	ware City,	Delaware Surface Elevation:		CRA Super	visor	: B. F	oulk	9		
ľ	GEOPHYSICAL LOG				SAMPLE DESCRIPTION				SAM	PLE I	DETA	ILS	
ſ		L		graphic	,								
ı		I		ervals	Order of Descriptors:		S M		Penet	ratior	ı	R	i
ı		T	(depths	in ft bgs)		S	AE			ord		E	
ı	Natural Gamma Log	H			Primary Component/Secondary Components	A	M T	Spli	t Spo	on Bl	ows	C	
1	(CPS)	0	_	ļ	Relative Density/Consistency, Grain	M	P H					0	P
ı		L	F	ĺ	Size/Plasticity, Gradation/Structure, Color,	P	L O					V	I
Į		0	R		Moisture Content, Supplementary Descriptors	L	I D					E	D
ı	0 10 20 30 40 50 60 70	G Y	O M	T		E	N	40		٠,		R	
ì	24	<u> </u>	IVI	 		#	G	6"	6"	6"	6"	Y	(ppm)
l	25 26	.	24	26	0 to 24 inches - dark gray, silty clay, moist.	13	split spoon	12	14	19	21	24"	121
	27 28		26	28	0 to 24 inches - dark gray, silty clay, moist.	14	split spoon	7	8	12	14	8"	36
	29	ļ	28	30	0 to 24 inches - dark gray, silty clay, moist.		split spoon	-	13	16	17	22"	1
١	31				0 to 14 inches - dark gray, silty clay, moist (9 ppm); 14 to 16 inches - fine white sand, moist (3								
J	32		30	32	ppm); 16 to 22 inches - fine brown sand, moist (3 ppm)	16	split spoon.	4	6	9	12	22"	9
İ	34		32	34	0 to 18 inches - fine brown sand, wet (20 ppm)	17	split spoon	9	11	17	19	28"	20
ŀ	35 36		34		0 to 18 inches - fine brown sand, wet (20 ppm)	18	split spoon	8	10	14	21	21"	22
	37 38		36	38 -	0 to 18 inches - fine brown sand, wet (31 ppm); 18 to 24 inches - light gray/yellow sand- fine, (0 ppm), wet	19	split spoon	8	13	15	16	24"	31
	39		38	40	0 to 8 inches - yellow/white sand, fine, wet.	20	split spoon	4	3	8	6	8"	5
	41 42		40		0 to 4 inches - yellow/white sand, fine, wet.	21	split spoon	6	5	4	4	4"	3.5
	43		42		0 to 5 inches - yellow/white sand, fine, wet; 5 to 10 inches - fine sand, turning brown with red lenses (3 ppm) wet.	22	split spoon	13	5	7	11	10"	18
	45 46		44	46	0 to 10 inches fine sand, yellow with reddish/brown streaks, wet.	23		9	11	16	21	6"	10
	47		46	48	0 to 8 inches - fine sand, yellow with reddish/brown streaks, wet.	24	split spoon	8	12	14	15	8"	3.5
١	40		Notes	-	, , , , , , , , , , , , , , , , , , , ,				_ 	1			
			and		nr - not recorded								
ſ] (Comments	s:	Completion Details:								
	CRA			·									

STRATIGRAPHIC AND GEOPH L. L. (OVERBURDEN)

Project Name: OxyChem - Delaware City

Project Number: 7462

Client: OxyChem - Glenn Springs

Location: Delaware City, Delaware

Drilling Contractor: ADT- MidAtlantic, Inc.

Driller: J. Jaworski

Drilling Method: 6-5/8" Hollow Steam Auger

Surface Elevation:

Hole Designati A-38D

Date Started: 10/5/98

Date Completed:

CRA Supervisor: B. Foulke

	Location	on: Delay	ware City	Delaware Surface Elevation:		CRA Super	visor	: B. I	oulk	e ·		
GEOPHYSICAL LOG	_			SAMPLE DESCRIPTION				SAM	IPLE I	DET A	ILS	
Natural Gamma Log (CPS)	L I T H O L	Inte	graphic ervals in ft bgs)	Order of Descriptors: Primary Component/Secondary Components Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Color,	S A M P	S M A E M T P H L O		Rec	ration cord on Bl		R E C O V	P
0 10 20 30 40 50 60 70	O G Y	R O M	T	Moisture Content, Supplementary Descriptors	L E	I D N G	6"	21			E R	ם
48 49 50	1	48		0 to 9 inches - fine, yellow sand, wet, few brown/red streaks	# 25	split spoon		6" 15	6" 22	6" 24	Y 9"	(ppm) 6.1
51 52 53		50	52	0 to 5 inches - fine, yellow sand, wet, few brown/red streaks	26	split spoon	14	18	25	29	5"	8.5
54 55		52 54		0 to 4 inches - fine, yellow sand, wet, few brown/red streaks 0 to 8 inches - reddish/brown-fine sand wet (1/2 of red sand at 7.5"); 8 to	27	split spoon	-	18	25	26	4"	22
56 57 58 59 60 61 62 63 64 65 66	\$ 4.0 W			10 inches - clay, Potomac, gray, red, purple-marbled clay, damp.	28	split spoon	20	8	13	23	10"	1
67 68 69 70 71 72		Notes	,	Depth of First Groundwater Encountered:								
CRA	-	and Comments	s:	nr - not recorded Completion Details:								

STRATIGRAPHIC AND GEOPH L (OVERBURDEN)

Project Name: OxyChem - Delaware City Project Number: 7462

Client: OxyChem - Glenn Springs

Drilling Contractor: ADTMA

Driller: J. Jaworski

Drilling Method: 6-5/8" HSA

Hole Designation: A-39D

Date Started: 9/28/98

Date Completed:

	Location: I	Delaware	Surface Elevation:		CRA Super	visor	: B. F	oulke	<u> </u>		
GEOPHYSICAL LOG		 	SAMPLE DESCRIPTION			_	SAM	PLE I	DETA	JLS	
	I	Stratigraphic Intervals epths in ft bgs	Order of Descriptors:	s	S M A E		Penet Rec		ı	R E	
Natural Gamma Log	H		Primary Component/Secondary Components	A	M T	Spli	it Spo		ows	c	
(CPS)	0		Relative Density/Consistency, Grain	М	РН					0	P
•	L	F	Size/Plasticity, Gradation/Structure, Color,	P	LO			Ì		v	I
	1 1	R	Moisture Content, Supplementary Descriptors	L	I D					E	מ
0 10 20 30 40 50 60 70		OT	•	E	N				:	R	
0	Y 1	м о		#	G	6"	6"_	6"	6°	Y	(ppm)
1 2		0 2	Gravel and brown sand, dry.	1	split spoon	4	6	12	13	17"	0
3 4		2 4	Medium-brown sand, dry.	2	split spoon	19	17	15	14	18"	0
6		4 6	Fine, medium brown sand, dry, traces of silty/clay-dark gray and some pieces of quartz.	3	split spoon	15	16	15	14	18"	0
7 8		6 8	0 to 18 inches - Fine, medium-brown sand, with gray silts and clays, dry.	4	split spoon	6	10	10	12	18"	0
9		8 10	0 to 11 inches - medium-sand, brown, moist.	5	split spoon	8	10	11	13	11"	0
11 12		10 12	0 to 16 inches - medium-sand, brown, moist.	6	split spoon	5	6	8	6	16"	0
13		12 14	0 to 22 inches - fine to medium, brown sand, traces of clay, moist.	7	split spoon	1	11	12	12	22"	. 0
15		14 16	0 to 6 inches - fine to medium, brown sand, traces of clay, moist; 6 to 12		,,	_		_	_		
16	 '	14 15	inches - fine to medium, brown sand, traces of clay, with white quartz 0 to 10 inches/6 to 12 inches - Fine to medium, brown sand, traces of clay,	8	split spoon	7	11	7	7_	12	0
17	1 1	16 18	moist	9	split spoon	6	7	5	. 6	10"	0
19 20	1	18 20	0 to 22 inches - medium brown sand with traces of gravel.		split spoon	7_	4	5	7	22"	0
21 22		20 22	0 to 2 inches - medium-coarse brown sand, wet; 2 to 24 inches - black peat with organic material, moist, black clay and silt.		split spoon	2	1	1	2	24"	0
23		22 24	0 to 19 inches - black silty-clay (peat) w/organic material, moist (0-39		 						
24		otes 24	ppm); 19 to 24 inches - gray clay w/organic material, moist (0 ppm) Depth of First Groundwater Encountered:	12	split spoon	9	7	7	6	24"	39
	1	nd	nr - not recorded								ļ
<u> </u>	-l (ments:	Completion Details:								
CRA		meno,	Completion Details.								ĺ

STRATIGRAPHIC AND GEOPH

Project Name: OxyChem - Delaware City
Project Number: 7462

Client: Occidental Chemical Corporation

Location: Delaware City, Delaware

GEOPH LL (OVERBURDEN)

Drilling Contractor: ADT- MidAtlantic, Inc.

Driller: J. Jaworski

Drilling Method: Hollow Stem Auger

Surface Elevation:

Hole Designation: A-39D

Date Started: 9/28/98

Date Completed:

CRA Supervisor: B. Foulke

	Locati	on: Delay	ware City	, Delaware Surface Elevation:		CRA Super	visor	: B. I	oulk	e		Į.
GEOPHYSICAL LOG				SAMPLE DESCRIPTION		·.·	, ,	SAM	IPLE I	DET.	ILS	
	L	Stratig	graphic			·					T	
	I	Inte	ervals	Order of Descriptors:		S M		Penet	tration	1	R	
	Т	(depths	in ft bgs)	-	s	A E	i	Rec	cord		E	
Natural Gamma Log	H			Primary Component/Secondary Components	A	МТ	Spl	it Spo	on Bl	ows	С	
(CPS)	0		[Relative Density/Consistency, Grain	M	PH					0	P
}	L	F	1	Size/Plasticity, Gradation/Structure, Color,	P	LO		ļ			v	I
	0	R		Moisture Content, Supplementary Descriptors	L	I D		i			E	D
0 10 20 30 40 50 60 70	G	0	T		E	N					R	
24	Y	M	. 0		#	G	6"	6"	6"	6"	Y	(ppm)
25				U to 2 inches - gray clay w/organic material, moist (U ppm); 2 to 8 inches -								
26	1		٠.	silty fine sand, wet (5 to 12 ppm); 8 to 18 inches - silty brown clay, wet (0	١		_				,	
27		24	26	ppm), low plasticity	13	split spoon	7	9	9	11	18"	12
28		1 2		0 to 10 inches - brown silty, very little clay, no plasticity (5-8 ppm), wet;	١							
29	1	26	28	10 to 24 inches - fine-medium brown sand, traces of coarse sand (0 ppm)	14	split spoon	8	12	13	19	24"	8
30	+					_					•	Į.
31		28	30	0 to 24 inches - well graded medium-coarse brown sand, wet.	15	split spoon	16	21	25	25	24"	0
32	ľ	, 00	20			_						
1 3 1 1		30	32	0 to 18 inches - well graded medium-coarse brown sand, wet.	16	split spoon	5	11	13	19	18"	0
33 34		1		0 to 5 inches - well graded medium-coarse brown sand, wet (0 ppm); 5 to 8 inches - lense of				:	, !			ľ
		32	34	silty brown clay (33 ppm), moist; 8 to 24 inches - medium-coarse brown sand, wet (0 ppm)	17	split spoon	5	6	13	16	24"	33
35												
36		34		0 to 20 inches - medium-coarse brown sand, wet.	_18	split spoon	5	9	9	9	20"	0
37	1			Brown/reddish brown sand (fine to med) with traces of gravel and								
38		36		seams of silty clay, wet.	19	split spoon	9	14	18	22	24"	0
39		4		Reddish/brown medium sand with red streaks (5 ppm from 6 - 8 inches),								
40		38	40	wet.	20	split spoon	9	15	17	23	13"	5
41 41												
42	1	40	42	Fine-medium brown sand with traces of gravel and reddish staining, wet.	_21	split spoon	7	_ 11	12	14	24"	0
43												
44		42	44	Medium brown sand, wet.	22	split spoon	9	11	13	19	21"	0
45	1											
46	1	44		Medium brown sand, wet.	23	split spoon	14	_20	21	23	24"	. 0
47				0 to 3 inches- red medium-coarse sand, wet; 3 to 9 inches - orangish								
48		46	48	brown medium sand, wet.	24	split spoon	14	16	23	28	12"	0
		Notes										
	_	and		nr - not recorded								
	7 (Comments	s:	Completion Details:								ł
CRA		1		•			•					
	1	<u> </u>			_							
		1										

STRATIGRAPHIC AND GEOPH

AL (OVERBURDEN)

Project Name: OxyChem - Delaware City Project Number: 7462

Client: OxyChem - Glenn Springs

Drilling Contractor: ADT- MidAtlantic, Inc.

Driller: J. Jaworski

Drilling Method: 6-5/8" Hollow Stem Auger

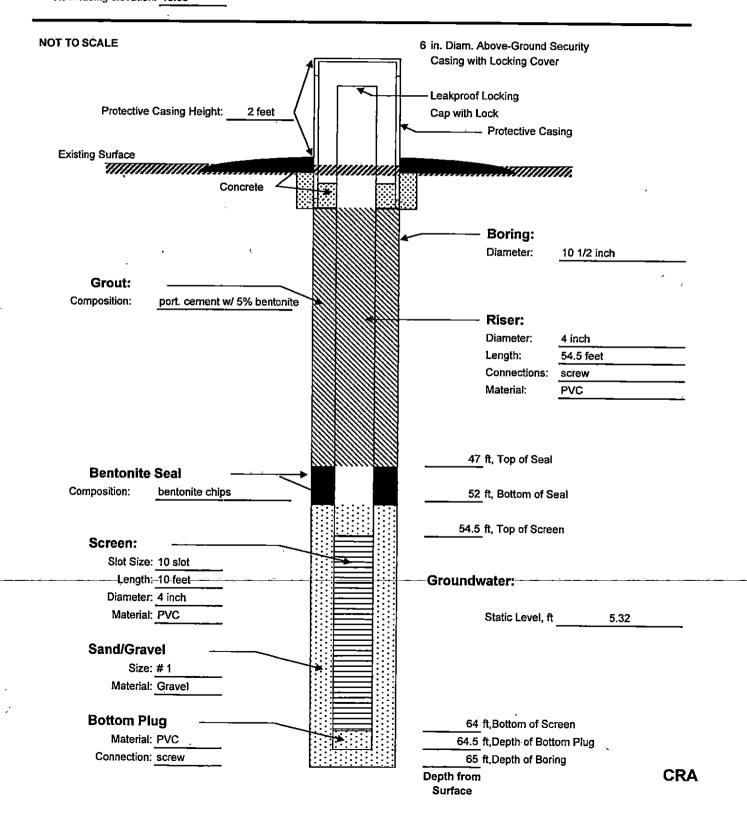
Hole Designati A-39D

Date Started: 9/28/98 10:00 am

Date Completed:

Location: Delaware City	Delaware Surface Elevation:		CRA Super	visor	: B. F	oulk	e		
GEOPHYSICAL LOG	SAMPLE DESCRIPTION				SAM	PLE I	DETA	ILS	
L Stratigraphic I Intervals T (depths in ft bgs)	Order of Descriptors:	S	S M A E		Penet Rec	ration ord	า	R	
Natural Gamma Log H (CPS) O	Primary Component/Secondary Components Relative Density/Consistency, Grain	A M	M T P H	Spl	it Spo	on Bl	ows	0 0	P
L F R O T	Size/Plasticity, Gradation/Structure, Color, Moisture Content, Supplementary Descriptors	P L E	L O I D N					V E R	I D
0 10 20 30 40 50 60 70 Y M O		#	G	6"	6"_	6"	6"	Y	(ppm)
49 48 50	0 to 4 inches - red and brown, medium sand; 4 to 16 inches - medium sand, some pieces cemented together in gravel size pieces (black in color)	25	split spoon	8	15	18	23	16"	0
51 50 52	Reddish/brown medium sand with traces of gravel (white stones).	26	split spoon	4	6	11	17	8"	0
53 54 55 55	Orangish/brown medium sand with gravel, wet. Orangish/brown wet, medium sand with gravel (increasing in size) (0 to	27	split spoon	5	10	11	15	24"	0
56 54 56	15 ppm over entire spooned sample).	28	split spoon	17	10	10	13	13°	15
57 56 58	0 to 8 inches - brown, medium sand with gravel and some clay content (0-21 ppm); 8 to 18 inches - red and gray clay, layered (marbled, Potomac, 0	29	split spoon	4	8	12	16	18"	21
59 60 61							 		
62 63									_
64 65							 		
66			_						
68 69									
70 71 72 72 73 74 75 75 75 75 75 75 75 75 75 75 75 75 75									
Notes and	Depth of First Groundwater Encountered: nr - not recorded		·		<u>. </u>				·
CRA Comments:	Completion Details:								

Project Name: Phase II RFI Hole Designation: A-31D Project No.: 7462 Date Completed: 9/17/98 Client: Occidental Chemical Corporation **Drilling Method:** 6 5/8-inch HS Augers Location: Delaware City, Delaware CRA Supervisor: B. Foulke Survey Information: top of inner casing: 18.79' Northing: 583335.4090 ground: 15.64' Easting: 444466.8438 steel casing elevation: 18.83'



Project Name: Phase II RFI Hole Designation: A-310B Project No.: 7462 Date Completed: 9/17/98 Client: Occidental Chemical Corporation Drilling Method: 6 5/8-inch HS Augers Location: Delaware City, Delaware CRA Supervisor: B. Foulke Survey Information: top of inner casing: 18.39' Northing 583334.7649 ground: 15.79' Easting: 444461.7695 steel casing elevation: 18.63' NOT TO SCALE 6 in. Diam. Above-Ground Security Casing with Locking Cover Leakproof Locking Protective Casing Height: 2 feet Cap with Lock - Protective Casing **Existing Surface** Concrete **Boring:** Diameter: 10 1/2 inch **Grout:** Composition: port, cement w/ 5% bentonite Riser: Diameter: 4 inch Length: 19.8 feet Connections: screw Material; **PVC** 15 ft, Top of Seal **Bentonite Seal** Composition: bentonite chips 18 ft, Bottom of Seal 19.5 ft, Top of Screen Screen: Slot Size: 10 slot Length:-10 feet Groundwater: Diameter: 4 inch Material: PVC Static Level, ft 7.57 Sand/Gravel Size: #1 Material: Grave! **Bottom Plug** 29.3 ft, Bottom of Screen

29.8 ft, Depth of Bottom Plug

CRA

30 ft, Depth of Boring

Depth from Surface

Material: PVC

Connection: screw

ADT-MA Trenton, New Jersey

Drilling Co.

WO No: 72208.00.01 Date Completed 8 Sep 94 Project R.F.I. Occidental Chemical Corporation Owner Location Del. City, Del. Bore Depth (ft) 60 Diameter 12-inch/8-inch North Surface Elev feet msl East Riser Elev feet msl PVC Length (ft) Screen 15 Diameter 4-inch Slot Size 10 slot / 0.01-inch Stabilized DTW feet TOC Riser PVC Length (ft) 45.0 Diameter 4-inch Drilling Method HS Auger Driller Dennis Moore Geologist Bill Gordon

A-32-D Delaware River A-31D A-29S Access Rd.

Location Sketch Map

Pa. Geo. No. PG-001466-G

	Depth (feet BGS)	PID Reading (ppm)	Well	Schematic	Split-Spoon #	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
								Recovery	
			_	7,				per 24"	Description
	0			7 🛭	1	4, 5	0-2	7/24	0-7" SILT, sandy, medium orange-brown, dry.
						12, 15			
						12, 15	L	11/24	0-11" SILT, sandy, medium orange-brown, dry,
					_	10, 10			with quartz pebbles.
							4-6	12/24	0-3" SILT, sandy, orange-brown.
	5				3	54			3-5" CLAY, silty, brown.
ļ	-					3, 3			5-12" Clay, silty, black, soft, moist.
<u> </u>					4	2, 2	6-8	12/24	0-8" CLAY, silty, black.
						1, 1			8-12" SILT, clayey, medium to light tan, soft, wet,
									with gravel and rounded quartz pebbles.
	10				5	1, 1	8-10	17/24	0-17" CLAY, silty, dk. grey to black, layered,
						1, 1			micaceous.
					6	1, 1	10-12	19/24	0-19" CLAY, silty, dk. grey to black, layered,
						1, 1			very soft, moist, with trace plant material.
					7	1, 1	12-14	20/24	0-20" CLAY, silty, dk. grey to black, layered, soft,
	15					2, 2			wet to moist with trace plant material.
					8	wt. of	14-16	24/24	0-24" CLAY, silty, dk grey to black, micaceous
						amme			trace plant material.
			_		9		16-18	12/24	0-12" CLAY, silty, dk grey to black, micaceous
						2, 1			wet to moist with trace plant material.
	20				10	2, 1	18-20	16/24	0-14" CLAY, silty, dk.grey to black A/A.
						2, 1	_		14-16" PEAT, abundant plant material, trace clay.
					11	1, 1	20-22	24/24	0-24" PEAT, 100% plant material, saturated.
					12	1, 1	22-24	24/24	0-24" PEAT, 100% plant material, saturated.
<u> </u>	25					1, 1			
<u> </u>					13	1,1	24-26	24/24	0-24" PEAT, abundant plant material, with about
						1,1			40% CLAY, silty, black, interlayered, wet.
					14	1, 1	26-28	24/24	0-24" PEAT, abundant plant material, with
						1, 1			CLAY, silty, black, interlayered, wet.

WO No:	72208	.00.01	_ 1	Date Co	mpleted	8 Sep 94	
Project	R.F.I.		Owner	Occid	ental Ch	emical Corpora	ation
Location	Del. C	ity, Del.	Bore Depti	n (ft)	60	Diameter	12-inch/8-inch
North			Surface Ele	ev	· <u> </u>	feet msl	
East			Riser Elev	·		feet msl	
Screen		PVC	Length (ft)		15	Diameter	4-inch
Slot Size	10 s	lot / 0.01-inch	Stabilized .	DTW		feet TOC	-
Riser	PVC		Length (ft)	`	45.0	Diameter	4-inch
Drilling M	Drilling Method HS Auger		Driller Dennis		s Moore	Geologist	Bill Gordon
Drilling Co.		ADT-MA Tre	nton, New Je	ersey		Pa. Geo. N	No. PG-001466-G

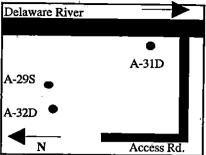
A-32-D Delaware River A-31D Access Rd.

Location Sketch Map

	Depth (feet BGS)	PID Reading (ppm)	Well Construction	Split-Spoon #	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
	30			15	1, 1	28-30	24/24	0-10" PEAT, 100% plant material, wet.
					1, 1			10-24" CLAY, silty, dk. grey to black, with 10% plants.
				16	1, 1	30-32	24/24	0-24" CLAY,silty, dk. grey to black, with abundant
					1, 1	-		plant material and 1" thick peat layers throughout.
				17	2, 2	32-34	24/24	0-24" CLAY, silty, dk. grey to black, with abundant
	35				2, 2			plant material.
	:			18	1, 1	34-36	24/24	0-10" PEAT, plant material with CLAY, black, wet.
					1, 2			10-24" CLAY, dk. grey to black, soft, wet, w/plants.
				19	1, 1	36-38	24/24	0-24" CLAY, silty, dk. grey to black, with abundant
					1, 1			interlayered plant material.
	40			20	1, 1	38-40	24/24	0-24" CLAY, silty, dk. grey to black, with abundant
					1, 1			interlayered plant material. Trace lt. grey clay.
				21	1, 1	40-42	18/24	0-18" CLAY, silty, medium grey-blue, soft, moist,
					1, 1			with abundant plant material (>25%).
			Yourney Sales	22	1, 1	42-44	24/24	0-24" CLAY, lt. grey-blue, "gunmetal grey", soft,
- "	45				1, 1			moist, with 5% plant material (It. tan color).
				23	1, 1	44-46	24/24	0-24" CLAY, lt. grey-blue, "gunmetal grey", soft,
	•				1, 1			moist, with increased plant material.
				24	1, 1	46-48	24/24	0-24" CLAY, lt. grey-blue, "gunmetal grey", soft,
					1, 1			moist, with< 5% plant material.
	50				1, 1	48-50	24/24	0-24" CLAY, lt. grey-blue, "gunmetal grey", soft,
					1, 1			moist, with trace plant material.
				26	5, 4	50-52	24/24	0-24" CLAY, It. grey-blue, "gunmetal grey", soft,
					5, 4			moist, increased 5% plant material.
				27	wt of	52-54	24/24	0-24" CLAY, lt. grey-blue, "gunmetal grey", soft,
	55			h	amme			moist, with25% plant material (blk to org-yellow).
			35 5 S	ti	2, 2	54-56	24/24	0-24" CLAY, lt. grey-blue, "gunmetal grey", soft,
					1, 2			moist, with25% plant material (blk to org-yellow).
				29	wt of	56-58	24/24	0-24" CLAY, lt. grey-blue, "gunmetal grey", soft,
				h	amme	r		moist, with25% plant material (blk to org-yellow).
	60			30	2, 2	58-60	24/24	0-24" CLAY, lt. grey-blue, "gunmetal grey", soft,
					3, 3			moist, with 50% plant material (blk to org-yellow).

WO No:	72208	3.00.01	_ 1	Date Co	mpleted	8 Sep 94	
Project	R.F.I.		Owner	Occid	ental Che	mical Corpora	ation
Location	Del. 0	City, Del.	Bore Dept	h (ft)	60	Diameter	12-inch/8-inch
North			Surface El	ev		feet msl	
East			Riser Elev			feet msl	
Screen		PVC	Length (ft))	15	Diameter	4-inch
Slot Size	10	slot / 0.01-inch	Stabilized	DTW		feet TOC	-
Riser	PVC		Length (ft)		45.0	Diameter	4-inch
Drilling Method		HS Auger	Driller	Denni	s Moore	Geologist	Bill Gordon
Drilling Co.		ADT-MA Tre	nton, New J	ersey		Pa. Geo. N	lo. PG-001466-G

A-32-D

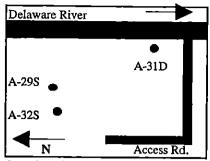


Location Sketch Map

Drilling Co.		ADT-	MA Trento	n, New Je	ersey		Pa. Geo. No. PG-001466-G				
	Depth (feet BGS)	PID Reading (ppm)	Well Construction Schematic	Split-Spoon #	Blows per 0.5 feet	Sample (feet BGS)	Sample Description/Classification				
Lithologic sa	amples	were c	ollected wit	h standaı	ď	-	Monitoring Well Construction Specifications				
split-spoons	(2 inch	x 2 fee	et). The dri	ving med	hanisn	1	Riser Interval (Feet BGS)				
was a 140 pc	ound ha	mmer	dropped 30	inches.			(4-inch PVC) Top +3				
Blow counts	were r	ecorde	i per 0.5 fo	ot interva	l.		Bottom 45				
						. ر	Screen Interval (Feet BGS)				
The 4.25-inc						<u> </u>	(4-inch PVC) Top 45				
with continu					.D.		Bottom 60				
augers were						_	Cement/Bentonite Grout (Feet BGS)				
4-inch diame							Top 0				
installed insi							Bottom 41				
installed, foll						g	Bentonite Seal (Feet BGS)				
annular space			-				Top 41				
bentonite mix					neter		Bottom 43				
steel protecti	ve casi	ng was	then instal	led.			Sand Pack #1 Morie (Feet BGS)				
							Top 43				
							Bottom 60				
							Surface completion is an above-grade protective steel				
			<u> </u>				casing (6-inch round x 5 feet long) grouted into place,				
							and a concrete surface pad poured around the casing.				
							The casing is secured with a locking				
			_ .				aluminum cover and marked with a metal identification				
							tag. The PVC riser is capped with a PVC slip fitting.				

WO No:	72208	3.00.01	_	Date Co	ompleted	9 Sep 94		
Project	R.F.I.	-	Owner	Occiden	ital Chem	ical Corporation		
Location	Del. C	City, Del.	Bore Dept	h (ft)	35	Diameter	12-inch/8-inch	
North			Surface El	ev		feet msl		
East			Riser Elev			feet msl		
Screen		PVC	Length (ft)		10	Diameter	4-inch	
Slot Size	10 8	slot / 0.01-inch	Stabilized DTW			feet TOC		
Riser	PVC		Length (ft)	1	25.0	Diameter	4-inch	
Drilling Method		HS Auger	Driller	Dennis I	Moore	Geologist	Bill Gordon	
Drilling Co.		ADT-MA Tre	nton, New J	ersey	Pa. Geo. N	lo. PG-001466-G		

A-32-S

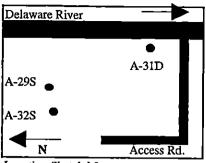


Location Sketch Map

	Depth (feet BGS)	PID Reading (ppm)	Well	Construction Schematic	Split-Spoon #	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
			-			_		Dagayanı	
 - 			├_					Recovery	Depoduction
	0			_ l		4,5	0-2	per 24" 7/24	Description
	- 0					12, 15	0-2	- 1124	0-7" SILT, sandy, medium orange-brown, dry.
					2	12, 15	2-4	11/24	0-11" SILT, sandy, medium orange-brown, dry,
,	_					10, 10	2-4	11/24	with quartz pebbles.
	-	_				10,10	4-6	12/24	0-3" SILT, sandy, orange-brown.
	5				3	54			3-5" CLAY, silty, brown.
						3,3			5-12" Clay, silty, black, soft, moist.
					4	2, 2	6-8	12/24	0-8" CLAY, silty, black.
		_				1,1			8-12" SILT, clayey, medium to light tan, soft, wet,
-					·			· -	with gravel and rounded quartz pebbles.
İ	10				5	1,1	8-10	17/24	0-17" CLAY, silty, dk. grey to black, layered,
						1, 1			micaceous.
					6	1, 1	10-12	19/24	0-19" CLAY, silty, dk. grey to black, layered,
						1,1			very soft, moist, with trace plant material.
					7	1,1	12-14	20/24	0-20" CLAY, silty, dk. grey to blacklayered, soft,
	15					2, 2			wet to moist with trace plant material.
					8	wt. of	14-16	24/24	0-24" CLAY, silty, dk grey to black, micaceous
						hammer			trace plant material.
			-	-	 9	1, 2	16-18	12/24	0-12" CLAY, silty, dk grey to black, micaceous
						2, 1			wet to moist with trace plant material.
	20				10	2, 1	18-20	16/24	0-14" CLAY, silty, dk.grey to black A/A.
						2, 1			14-16" PEAT, abundant plant material, trace clay.
					11	1,1	20-22	24/24	0-24" PEAT, 100% plant material, saturated.
			ninn.	anni.					
					12	1, 1	22-24	24/24	0-24" PEAT, 100% plant material, saturated.
	25					1, 1			
					13	1, 1	24-26	24/24	0-24" PEAT, abundant plant material, with about
						1,1			40% CLAY, silty, black, interlayered, wet.
				2	14	1, 1	26-28	24/24	0-24" PEAT, abundant plant material, with

WO No:	72208	3.00.01	_	Date Co	ompleted	9 Sep 94	
Project	R.F.I.		Owner	Occiden	ital Chemi	cal Corporation	n
Location	Del. (City, Del.	Bore Dept	h (ft)	35	Diameter	12-inch/8-inch
North			Surface El	ev		feet msl	
East			Riser Elev			feet msl	
Screen		PVC _	Length (ft)		10	Diameter	4-inch
Slot Size	10	slot / 0.01-inch	Stabilized DTW			feet TOC	
Riser		PVC	Length (ft)		25.0	Diameter	4-inch
Drilling Method		HS Auger	Driller	Dennis l	Moore	Geologist	Bill Gordon
Drilling Co.		ADT-MA Tre	nton, New J	ersey		Pa. Geo. N	o. PG-001466-G

A-32-S

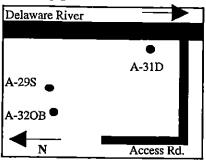


Location Sketch Map

r				,								
	Depth (feet BGS)	PID Reading (ppm)	Well Construction Schematic	Split-Spoon#	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification				
					1, 1			CLAY, silty, blac	ck, interlaye	red, wet.		
	30			15	1, i	28-30	24/24	0-10" PEAT, 100	% plant mate	erial, wet.		
					1,1			10-24" CLAY, sil	lty, dk. grey	to black, with 10% plants.		
				16	_1,1	30-32	24/24	0-24" CLAY,silty	, dk. grey to	black, with abundant		
			*	<u></u>	1, 1			plant material and	1 1" thick pea	at layers throughout.		
			₹ 1	17	2,2	32-34	24/24	0-24" CLAY,silty	, dk. grey to	black, with abundant		
	35				2,2			plant material.				
				18	1,1	34-35	12/12	0-10" PEAT, plan	nt material w	ith CLAY, black, wet.		
		_			1,2		1	10-24" CLAY, dk	grey to blac	k, soft, wet, w/plants.		
<u> </u>			<u> </u>							<u>-</u>		
								Monitoring Well (Construction	Specifications		
Lithologic sa								Riser Interval		(Feet BGS)		
split-spoons	•		•		hanism			(4-inch PVC)	Тор	+3		
was a 140 pc							ļ. <u> </u>		Bottom	<u>25</u>		
Blow counts	were re	corded	l per 0.5 fo	ot interva	l.		_	Screen Interval		(Feet BGS)		
								(4-inch PVC)	Тор			
The 8.25-inc				nced to 35	ft bgs,				Bottom	35		
with continu							ļ. <u> </u>	Cement/Bentonite	Grout	(Feet BGS)		
4-inch diame									Тор	0		
installed ins									Bottom	21		
installed, fol								Bentonite Seal		(Feet BGS)		
annular spac									Тор	21		
bentonite mi					neter	<u>. </u>			Bottom	23		
steel protecti	ve casii	ng was	then instal	lled.				Sand Pack #1 Mor	гіе	(Feet BGS)		
									Тор	23		
									Bottom	35		
			. <u>.</u>	_			Surface comp	letion is an above-	grade protec	tive steel		
_							casing (6-incl	n round x 5 feet lor	ng) grouted i	nto place,		
						_	and a concret	e surface pad pour	ed around th	e casing.		
							The casing is	secured with a loc	king			
							aluminum cover and marked with a metal identification					
							tag. The PVO	Criser is capped w	rith a PVC sl	ip fitting.		

WO No:	72208	.00.01	_	Date Co	mpleted	8 Sep 94	
Project	R.F.I.		Owner	Occiden	tal Chem	ical Corporation	n
Location	Del. C	City, Del.	Bore Dept	th (ft)	15	Diameter	8.25-inch
North	rth			lev		feet msl	
East			Riser Elev	,		feet msl	
Screen		PVC	Length (ft)		15	Diameter	4-inch
Slot Size	10 s	lot / 0.01-inch	Stabilized DTW			feet TOC	
Riser		PVC	Length (ft)	45.0	Diameter	4-inch
Drilling Method		HS Auger	Driller Dennis N		Moore	Geologist	Bill Gordon
Drilling Co.		ADT-MA Tre	nton, New J	ersey		Pa. Geo. No	o. PG-001466-G

A-32-OB



Location Sketch Map

	Depth (feet BGS)	PID Reading (ppm)	Well	Schematic Split-Spoon #	Blows per 0.5 feet	Sample (feet BGS)		Sample Description/Classification
							Recovery	
				1	,		per 24"	Description
	0			1	4, 5	0-2	7/24	0-7" SILT, sandy, medium orange-brown, dry.
					12, 15			
				2	12, 15	2-4	11/24	0-11" SILT, sandy, medium orange-brown, dry,
					10, 10			with quartz pebbles.
			eren e		ļ	4-6	12/24	0-3" SILT, sandy, orange-brown.
	5	_		3				3-5" CLAY, silty, brown.
			3 6 6	2 4	3,3	ļ		5-12" Clay, silty, black, soft, moist.
				4	2,2	6-8	12/24	0-8" CLAY, silty, black.
					1,1			8-12" SILT, clayey, medium to light tan, soft, wet,
					<u> </u>			with gravel and rounded quartz pebbles.
	10			5	- 	8-10	17/24	0-17" CLAY, silty, dk. grey to black, layered,
			2.	Ž	1, 1			micaceous.
L				6	- ''	10-12	19/24	0-19" CLAY, silty, dk. grey to black, layered,
					1,1			very soft, moist, with trace plant material.
<u> </u>	_			7		12-14	20/24	0-20" CLAY, silty, dk. grey to black layered, soft,
	15			<u></u>	2, 2			wet to moist with trace plant material.
ļļ.				8	wt. of	14-15	12/12	0-12" CLAY, silty, dk grey to black, micaceous
				 	hammer			trace plant material.
						<u> </u>		
	20						_	
				_				Monitoring Well Construction Specifications
	ithologic samples were collected with standard							Riser Interval (Feet BGS)
split-spoons					chanism			(4-inch PVC) Top +3
was a 140 po								Bottom 5
Blow counts	were re	corded	per 0.5	foot interv	al			Screen Interval (Feet BGS)
ļ								(4-inch PVC) Top 5
								Bottom 15
The 8.25-incl			ere adva	nced				Cement/Bentonite Grout (Feet BGS)
to a depth of	15 ft. l	ogs.					_	Top 0

WO No:	72208	3.00.01	_	Date Co	8 Sep 94			
Project	R.F.I.		Owner	Occiden	tal Chen	mical Corporation		
Location	Del. C	City, Del.	Bore Dep	th (ft)	15	Diameter	8.25-inch	
North			Surface E	lev		feet msl		
East		-	Riser Elev	,	-	feet msl		
Screen		PVC	Length (ft)		15	Diameter	4-inch	
Slot Size	10	slot / 0.01-inch	Stabilized DTW			feet TOC		
Riser	PVC		Length (ft)	45.0	Diameter	4-inch	
Drilling Method		HS Auger	Driller	Dennis I	Moore	Geologist	Bill Gordon	
Drilling Co		ADT-MA Tre	nton, New J	ersey		Pa. Geo. No	. PG-001466-G	

A-32-OB

Delaware River

A-31D

A-32OB

A-32OB

Access Rd.

Location	Sketch	Man

2	Depth (feet BGS)	PID Reading (ppm)	Well Construction Schematic	Split-Spoon #	Blows per 0.5 feet	Sample (feet BGS)	Sample Description/Class	ification	
4-inch diam	4-inch diameter PVC screen and casing was then						Bottom	3	
installed inside the augers. Then a sand pack was					was_		Bentonite Seal	(Feet BGS)	
installed, followed by a bentonite plug. The remaining					maining		Тор	3	
annular space was tremmie gouted with a cement-				nt-	_	Bottom	5		
bentonite mix to ground surface. A 6-inch diameter					neter		Sand Pack #1 Morie	(Feet BGS)	
steel protective casing was then installed.							Тор	5	
					_		Bottom	15	
							Surface completion is an above-grade protective steel		
							casing (6-inch round x 5 feet long) grouted into place,		
							and a concrete surface pad poured around the casing.		
							The casing is secured with a locking		
							aluminum cover and marked with a metal identification		
							tag. The PVC riser is capped with a PVC slip fitting.		

Project Name: Phase II RFI Hole Designation: A-33D Project No.: 7462 Date Completed: 9/22/98 Client: Occidental Chemical Corporation **Drilling Method:** 6 5/8-inch HS Augers Location: Defaware City, Delaware **CRA Supervisor:** B. Foulke Survey Information: top of inner casing: 26.72 Northing: 583146.8828 ground: 24.42 Easting: 441374.7781 **NOT TO SCALE** 6 in. Diam. Above-Ground Security Casing with Locking Cover Leakproof Locking Protective Casing Height: 2 feet Cap with Lock **Protective Casing Existing Surface** Concrete **Boring:** Diameter: 10 1/2 inch **Grout:** Composition: port. cement w/ 5% bentonite Riser: Diameter: 4 inch Length: 60 feet Connections: screw Material: **PVC** 52 ft, Top of Seal **Bentonite Seal** Composition: bentonite chips 57.5 ft, Bottom of Seal 60 ft, Top of Screen Screen: Slot Size: 10 slot Length: 10 feet Groundwater: Diameter: 4 inch First Encountered, ft Material: PVC Static Level; ft Sand/Gravel Size: #1 Material: Gravel **Bottom Plug** 69.5 ft,Bottom of Screen Material: PVC 70 ft, Depth of Bottom Plug Connection: screw 70 ft, Depth of Boring Depth from Surface

WELL CONSTRUCTION LOG Project Name: Phase II RFI Hole Designation: A-33S 7462 Project No.: Date Completed: 9/22/98 Client: Occidental Chemical Corporation **Drilling Method:** 6 5/8-inch HS Augers Location: Delaware City, Delaware **CRA Supervisor:** B. Foulke Survey Information: top of inner casing: 25.95' Northing: 583146.7755 ground: 24.43' Easting: 441369.8433 steel casing elevation: 26.67' **NOT TO SCALE** 6 in. Diam. Above-Ground Security Casing with Locking Cover Leakproof Locking Protective Casing Height: 2 feet Cap with Lock **Protective Casing Existing Surface** and thillille Concrete **Boring:** Diameter: 10 1/2 inch **Grout:** Composition: port. cement w/ 5% bentonite Riser: Diameter: 4 inch Length: 35 feet Connections: screw Material: **PVC** 31 ft, Top of Seal

Bentonite Seal Composition: bentonite chips 33 ft, Bottom of Seal 35 ft, Top of Screen Screen: Slot Size: 10 slot Length: 15 feet **Groundwater:** Diameter: 4 inch Material: PVC Static Level, ft 5.13 Sand/Gravel Size: #1 Material: Gravel **Bottom Plug** 49.5 ft,Bottom of Screen

Material: PVC

Connection: screw

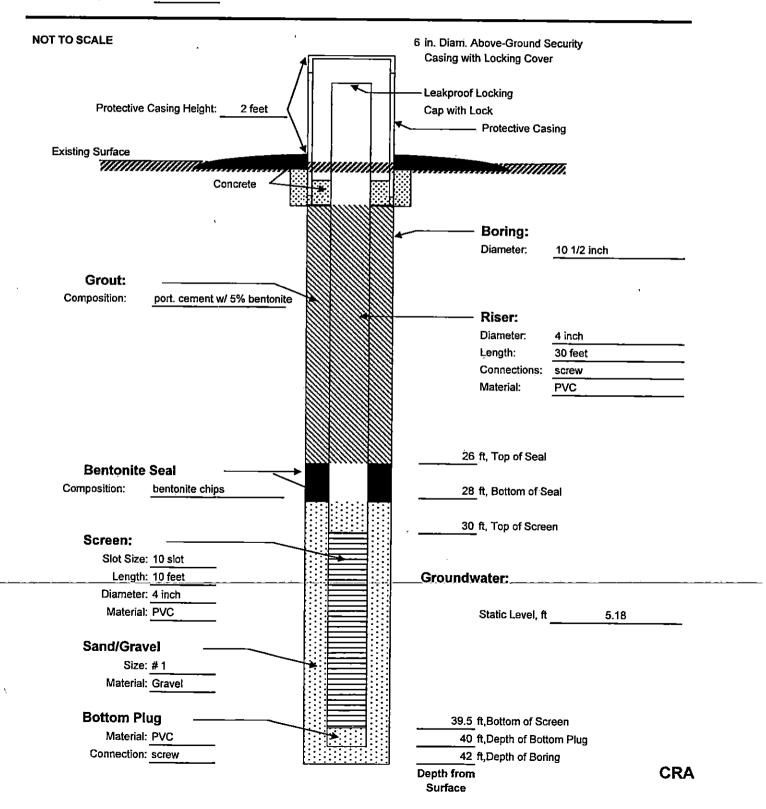
Depth from Surface

50 ft, Depth of Bottom Plug

50 ft, Depth of Boring

CRA

Project Name: Phase II RFI Hole Designation: A-34D 7462 Project No.: Date Completed: 9/24/98 Client: Occidental Chemical Corporation **Drilling Method:** 6 5/8-inch HS Augers Location: Delaware City, Delaware **CRA Supervisor:** B. Foulke Survey Information: top of inner casing: 28.52' Northing: 583111.6878 ground: 27.08' Easting: 440677.1628 steel casing elevation: 29.12'



Project Name: Phase II RFI Hole Designation: A-34S Project No.: 7462 Date Completed: 9/24/98 Client: Occidental Chemical Corporation 6 5/8-inch HS Augers **Drilling Method:** Location: Delaware City, Delaware CRA Supervisor: B. Foulke Survey Information: top of inner casing: 28.74' Northing: 583111.7469 ground: 27.03' Easting: 440671.8176 steel casing elevation: 28.95' **NOT TO SCALE** 6 in. Diam. Above-Ground Security Casing with Locking Cover Leakproof Locking Protective Casing Height: 2 feet Cap with Lock **Protective Casing Existing Surface** and the state of t Concrete Boring: Diameter: 10 1/2 inch **Grout:** Composition: port. cement w/ 5% bentonite Riser: Diameter: 4 inch Length: 18 feet Connections: screw Material: **PVC** 14 ft, Top of Seal **Bentonite Seal** Composition: bentonite chips 16 ft, Bottom of Seal 18 ft, Top of Screen Screen: Slot Size: 10 slot Length: 10 feet Groundwater: Diameter: 4 inch Material: PVC Static Level, ft 5.18 Sand/Gravel Size: #1 Material: Gravel **Bottom Plug** 28.5 ft, Bottom of Screen

28 ft, Depth of Bottom Plug

CRA

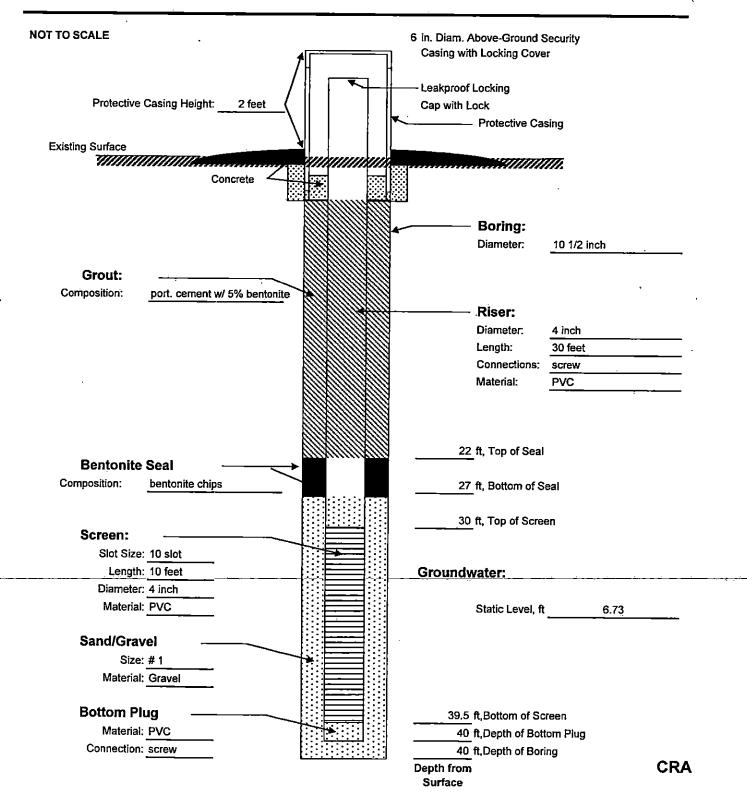
29 ft, Depth of Boring

Depth from Surface

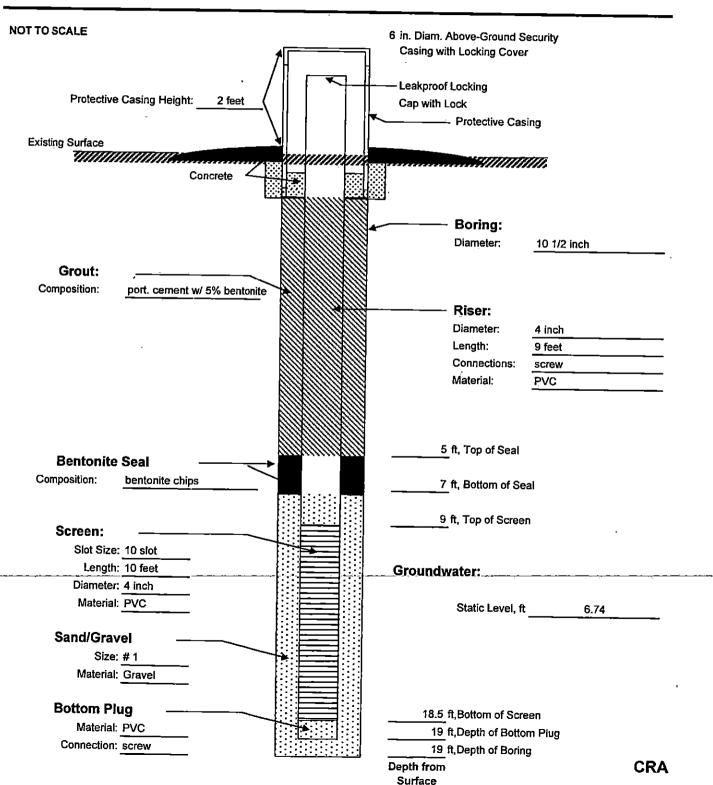
Material: PVC

Connection: screw

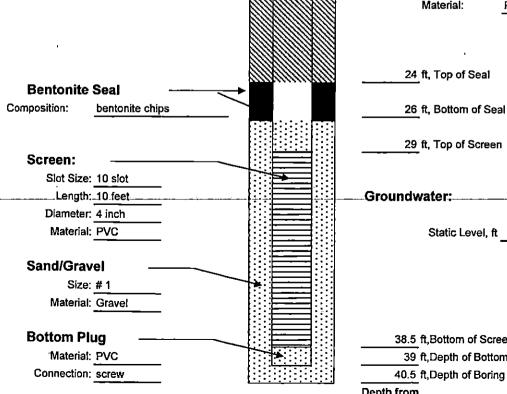
Project Name: Phase II RFI Hole Designation: A-35D 7462 Project No.: Date Completed: 10/2/98 Client: Occidental Chemical Corporation Drilling Method: 6 5/8-inch HS Augers Location: Delaware City, Delaware CRA Supervisor: B. Foulke Survey Information: top of inner casing: 16.05' Northing: 583229.1585 ground: 13.52' Easting: 440360.0068 steel casing elevation: 16.32'



Project Name: Phase II RFI Hole Designation: A-35S Project No.: 7462 Date Completed: 10/2/98 Client: Occidental Chemical Corporation **Drilling Method:** 6 5/8-inch HS Augers Location: Delaware City, Delaware CRA Supervisor: B. Foulke Survey Information: top of inner casing: 16.21' Northing: 583229.4013 ground: 13.82' Easting: 440368.1848 steel casing elevation: 16.49'



WELL CONSTRUCTION LOG Phase II RFI Project Name: Hole Designation: A-36D 7462 Project No.: Date Completed: 10/14/98 Client: 6 5/8-inch HS Augers Occidental Chemical Corporation Drilling Method: Location: Delaware City, Delaware CRA Supervisor: B. Foulke Survey Information: top of inner casing: 29.78' Northing: 582593.8690 ground: 27.02' Easting: 440449.5542 steel casing elevation: 29.98' **NOT TO SCALE** 6 in. Diam. Above-Ground Security Casing with Locking Cover Leakproof Locking Protective Casing Height: 2 feet Cap with Lock Protective Casing **Existing Surface** Concrete **Boring:** Diameter: 10 1/2 inch **Grout:** Composition: port. cement w/ 5% bentonite Riser: Diameter: 4 inch Length: 29 feet Connections: screw Material: PVC 24 ft, Top of Seal



8.12

38.5 ft,Bottom of Screen 39 ft,Depth of Bottom Plug 40.5 ft, Depth of Boring

Depth from

Surface

Project Name: Phase II RFI Hole Designation: A-36S Project No.. 7462 Date Completed: 10/13/98 Client: Occidental Chemical Corporation Drilling Method: 6 5/8-inch HS Augers Location: Delaware City, Delaware CRA Supervisor: B. Foulke Survey Information: top of inner casing: 29.85' Northing: 582595.5173 ground: 26.95' Easting: 440449.2951 steel casing elevation: 29.99' **NOT TO SCALE** 6 in. Diam. Above-Ground Security Casing with Locking Cover Leakproof Locking Protective Casing Height: 2 feet Cap with Lock Protective Casing **Existing Surface** Concrete Boring: Diameter: 10 1/2 inch **Grout:** Composition: port. cement w/ 5% bentonite Riser: Diameter: 4 inch Length: 15 feet Connections: screw Material: **PVC** 11 ft, Top of Seal **Bentonite Seal** Composition: bentonite chips 13 ft, Bottom of Seal 15 ft, Top of Screen Screen: Slot Size: 10 slot Length: 10 feet. Groundwater: Diameter: 4 inch Material: PVC Static Level, ft 8.13 Sand/Gravel Size: #1 Material: Gravel **Bottom Plug**

Material: PVC

Connection: screw

24.5 ft, Bottom of Screen

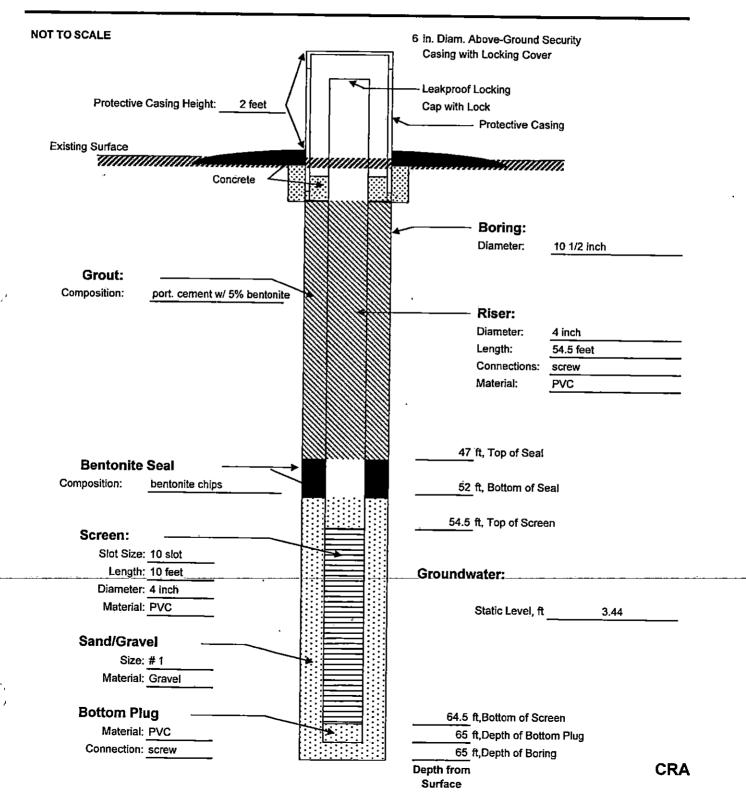
25 ft, Depth of Boring

Depth from Surface

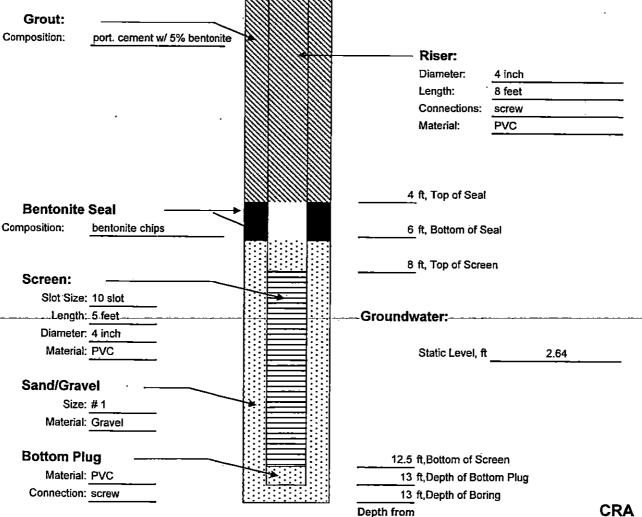
25 ft, Depth of Bottom Plug

CRA

Project Name: Phase II RFI Hole Designation: A-37D 7462 Project No.: Date Completed: 10/12/98 Client: Occidental Chemical Corporation Drilling Method: 6 5/8-inch HS Augers Location: Delaware City, Delaware CRA Supervisor: B. Foulke Survey Information: top of inner casing: 6.52' Northing: 583629.1913 ground: 4.70' Easting: 442138.5133 steel casing elevation: 6.66'

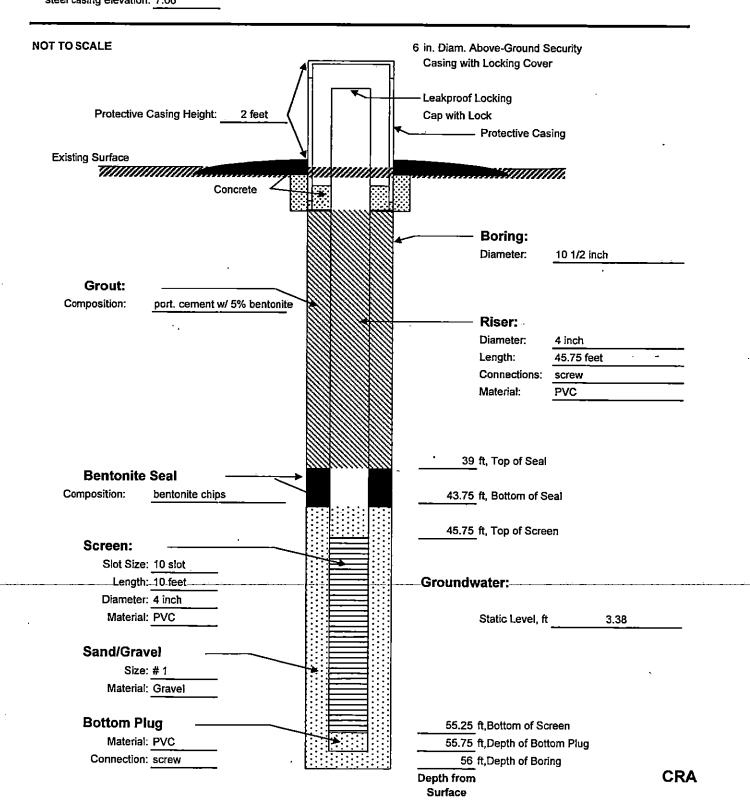


WELL CONSTRUCTION LOG Project Name: Phase II RFI Hole Designation: A-37S Project No.: 7462 Date Completed: 10/12/98 Client: Occidental Chemical Corporation **Drilling Method:** 6 5/8-inch HS Augers Location: Delaware City, Delaware CRA Supervisor: B. Foulke Survey Information: top of inner casing: 6.20' Northing: 583632.4184 ground: 4.63' Easting: 442141.4332 steel Casing Elevation: 6.40' **NOT TO SCALE** 6 in. Diam. Above-Ground Security Casing with Locking Cover Leakproof Locking Protective Casing Height: 2 feet Cap with Lock Protective Casing **Existing Surface** Concrete Boring: Diameter: 10 1/2 inch **Grout:** Composition: port. cement w/ 5% bentonite Riser: Diameter: 4 inch Length: 8 feet

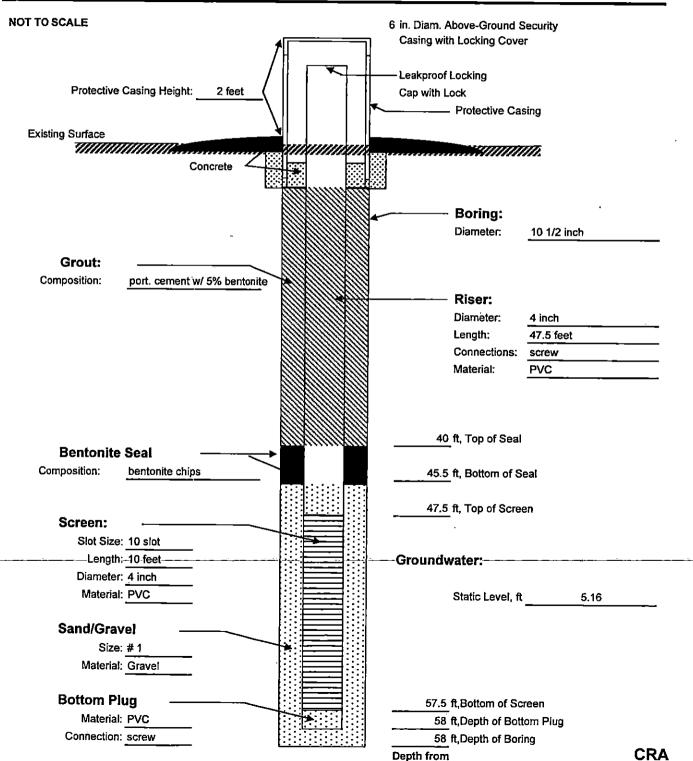


Surface

Project Name: Phase II RFI Hole Designation: A-38D Project No.: 7462 Date Completed: 10/7/98 Client: Occidental Chemical Corporation Drilling Method: 6 5/8-inch HS Augers Location: Delaware City, Delaware CRA Supervisor: B. Foulke Survey Information: top of inner casing: 6.86' Northing: 583562.9564 ground: 5.54' Easting: 442060.5302 steel casing elevation: 7.06'



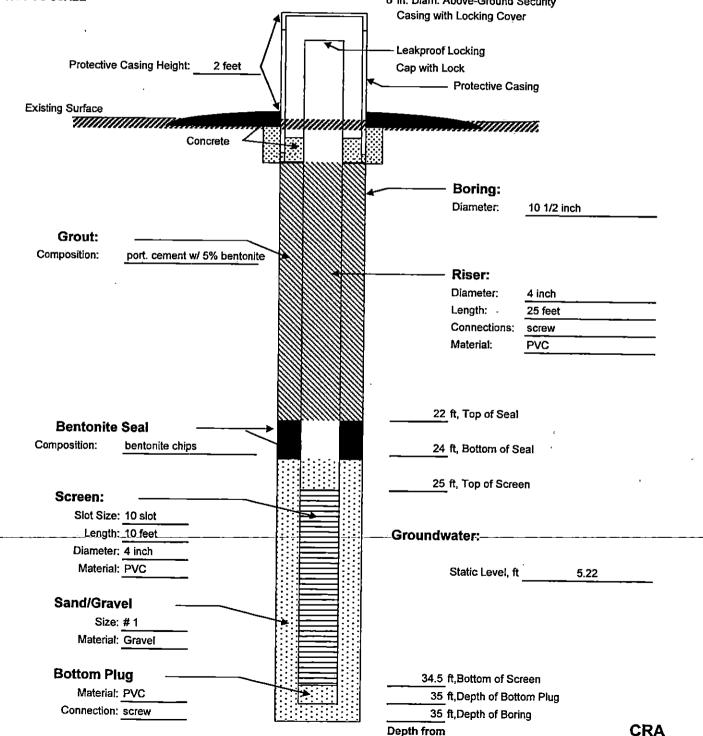
Project Name: Phase II RFI Hole Designation: A-39D Project No.: 7462 Date Completed: 9/29/98 Client: Occidental Chemical Corporation **Drilling Method:** 6 5/8-inch HS Augers Location: Delaware City, Delaware CRA Supervisor. B. Foulke Survey Information: top of inner casing: 22.36' Northing: 583202.3834 ground: 20.19' Easting: 441930,5249 steel casing elevation: 22.66'



Surface

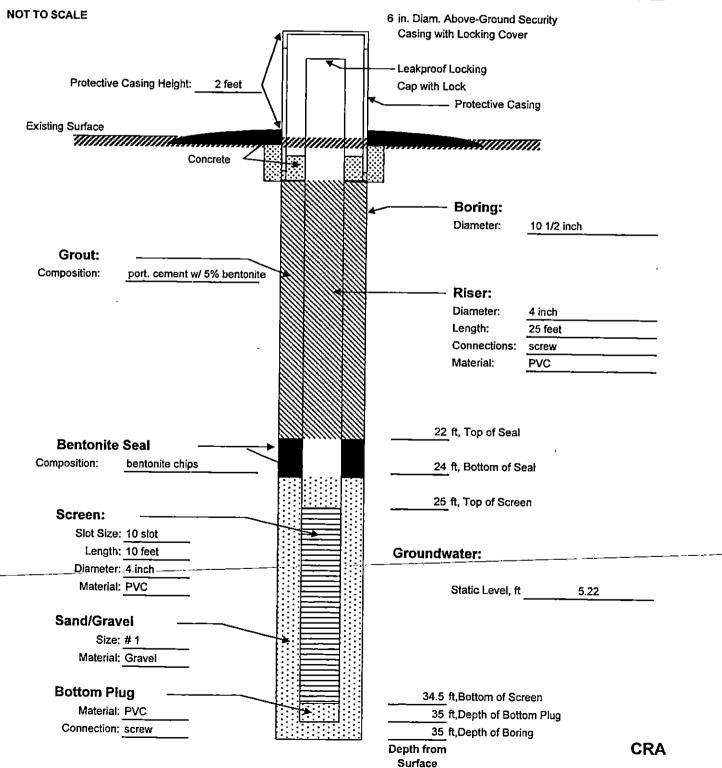
CRA

Project Name: Phase II RFI Hole Designation: A-39S Project No.: 7462 Date Completed: 9/29/98 Client: Occidental Chemical Corporation 6 5/8-inch HS Augers Drilling Method: Location: Delaware City, Delaware CRA Supervisor: B. Foulke Survey Information: top of inner casing: 22.43' Northing: 583199.5604 ground: 20.54' Easting: 441925.9380 steel casing elevation: 22.78' **NOT TO SCALE** 6 in. Diam. Above-Ground Security Casing with Locking Cover Leakproof Locking Protective Casing Height: 2 feet Cap with Lock

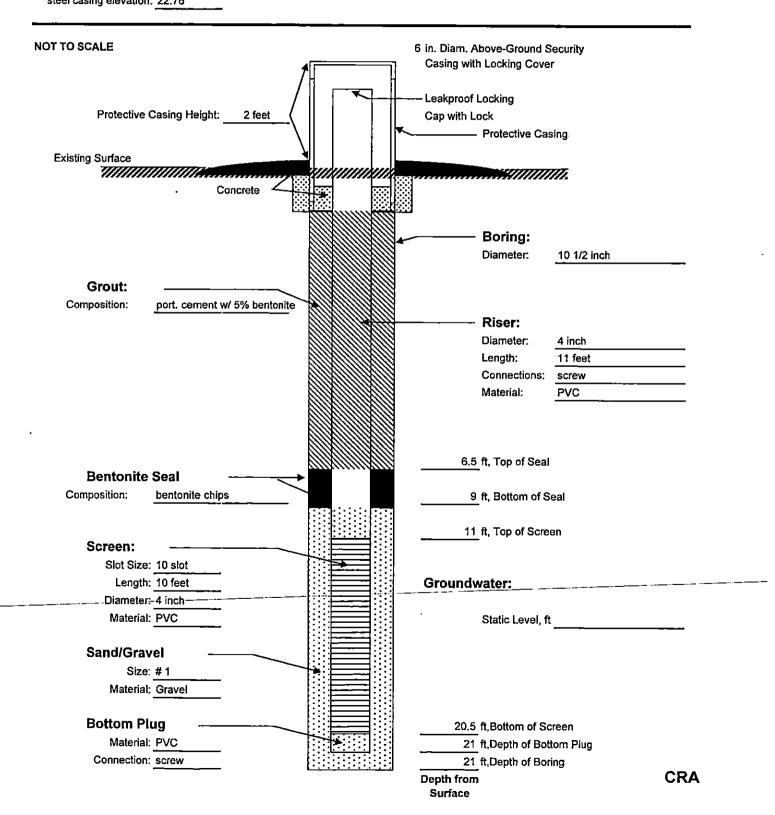


Surface

Project Name: Phase II RFI Hole Designation: A-39S Project No.: 7462 Date Completed: 9/29/98 Client: Occidental Chemical Corporation Drilling Method: 6 5/8-inch HS Augers Location: Delaware City, Delaware **CRA Supervisor:** B. Foulke Survey Information: top of inner casing: 22.43' Northing: 583199.5604 ground: 20.54' Easting: 441925.9380 steel casing elevation: 22.78'



Project Name: Phase II RFI Hole Designation: A-39OB Project No.: 7462 Date Completed: 10/1/98 Client: Occidental Chemical Corporation **Drilling Method:** 6 5/8-inch HS Augers Location: Delaware City, Delaware CRA Supervisor: B. Foulke Survey Information: top of inner casing: 22.57' Northing: 583197.8202 ground: 20.52' Easting: 441921.9834 steel casing elevation: 22.76'



MARSH CORE LOGS

TEST PIT STRATIGRAPHY LOG Page 1 of 1 Project Name: Phase II RFI Contractor: Test Pi Destination - 0-20 Project Number: 7462 Date Started: 1/26/99 Client: OxyChem Surface Elevation: Date Completed: 1/26/99 Location: Delaware City, DE Test Pit Method CRA Supervisor: J. Garges, B. Foulke, A. Williams Soil Symbol, Primary Component, Secondary Location: Depth (m/ft) Components, Relative Density/Consistency, Grain Size/Plasticity, Gradation/Structure, Colour, Sample Sample Moisture Content, Supplementary Descriptors From At To Interval PIDGeologic Profile 0 12 Silty clay w/, orange material, brown, iron ferdite veins 1 recovery approximately 5.5 ft. Clay, gray-black 12 24 2 24 24 Tan brown, medium brown sand 24-36 3 sample collected from this interval. 36-60 Completed by: ____ Date: _____ **CRA**

1			TEST	r PIT STR	ATIGRAF	HY LO	OG					
1						-	Page 1 of 1					
Project Name: Phase II RFI Contract Project Number: 7462			Contractor: Normandeat	-			Test Pi Destination - C-21					
Client:	_	OxyChem	Surface Elevation:		-		Started: 1/13/99					
Location:	-	Delaware City, DE	Test Pit Method: Vibraco				Completed: 1/13/99					
Soil Symbol, Primary Comp Depth (m/ft) Components, Relative Dens Size/Plasticity, Gradation/S		mponent, Secondary nsity/Consistency, Grain n/Structure, Colour,	ndary ncy, Grain plour, Sample Sample		CRA S	Supervisor: J. Garges, B. Foulke, A. Williams Location:	<u> </u>					
From At	To	Moisture Content, Supple		#	Interval	PID	Geologic Profile					
0	10	Organic material, brown (pl gray to black, moist.	nragmites) and clay, dark	1	0 -10'	0	5 ft. of recovery. Negative reaction to Sudan Dye.					
Completed by	/:				 L							
CRA	, - <u></u> -		_				Date:					

TEST PIT STRATIGRAPHY LOG								
Project Name: Phase II RFI Contractor:	Normandeau Assoc.	Test Pi Destination - C-23						
Project Number: 7462		Date Started: 1/25/99						
Client: OxyChem Surface Ele	vation:	Date Completed: 1/25/99						
	thod: Vibracone	CRA Supervisor: B. Foulke/A. Williams						
Depth (in.) Soil Symbol, Primary Component, Seco Components, Relative Density/Consiste Size/Plasticity, Gradation/Structure, Co	ency, Grain olour, Sample Sam	Location:						
From At To Moisture Content, Supplementary Description	riptors # Inter	erval PID Geologic Profile						
0 18 Gray clay (2 to 5%) Orange material 18 52 Peat 52 end Tan, brown silt and fine sand	1 2	2500 recovery = 9.0 ft.						
Completed by:		Date:						
CRA		Dutc						

TEST						PIT STR	ATIGRAP	HY LO	<u> </u>						
Proje	ct Nan	ie:	Phase II RFI		Contractor: Normandeau Assoc.				Test Pi Destination - C-24						
Proje	ct Nun	nber:	7462					Date S	tarted: 1/26/99						
Clien			OxyChem		Surface Elevation:			Date C	Completed: 1/26/99						
Locat	ion:		Delaware City,		Test Pit Method: Vibraco	one		CRA S	upervisor: B. Foulke/A. Williams/J. Garges						
D	Depth (in.)		Components, Ro Size/Plasticity,	elative Den Gradation	ponent, Secondary sity/Consistency, Grain /Structure, Colour,	Sample	Sample		Location:						
Front	At	To	Moisture Conte	nt, Supplen	ientary Descriptors	#	Interval	PID	Geologic Profile						
36			Black/gray clay Organic material,	/peat		1 2	36-42'		recovery 3.5 ft. 2 samples collected from this interval						
Compl	eted by	;							Date:						

	TEST PIT STRATIGRAPHY LOG								
Proje	ct Nan	ne:	Phase II RFI	Contractor: Normandeau	Assoc.		Test Pi	i Destination - C-25	
Proje	Project Number: 7462				Date S	tarted: 1/25/99			
Clien			OxyChem	Surface Elevation:			Date C	Completed: 1/25/99	
Locat	ion:		Delaware City, D		ne			upervisor: B. Foulke/A. Williams/J. Garges	
	epth (ii		Components, Rela Size/Plasticity, G	nary Component, Secondary ative Density/Consistency, Grain tradation/Structure, Colour,	Sample	Sample		Location:	
From	At	To	Moisture Content	t, Supplementary Descriptors	#	Interval	PID	Geologic Profile	
6 30		33	Dark gray clay Black organic fines		1 2		0	approx. 5 ft recovery.	
33		60	Peat. Organic mater	rial.	3		0	sampled 2.5 to 3 ft. interval.	
	eted by:	:		1				Date:	
CR	CRA								

APPENDIX I

PHASE II RFI DATA VALIDATION REPORTS



CRA Services

2055 Niagara Falls Blvd., Suite Three

Niagara Falls, NY 14304

(716) 297-2160 Office (716) 297-2265 Fax

		DATE:	May 13, 1999						
		PROJECT NUMBER:	7462						
		PROJECT NAME:	Delaware City, Delaware						
TRANSMITTA	AL TO:								
Mr. John Garg		_							
	vers & Associates hlan Avenue, #120	_							
Exton, PA 19		_							
		_							
			•						
		-							
Please find:	☐ Draft								
	Originals	Other							
	Prints	<u> </u>							
Sent via:	☐ Mail	Same Day Courier							
	Overnight Courier	Other							
			·						
QUANTITY		DESCRIPTION							
1	Analytical Data Assessmen	nt and Validation, Phase I	I - RCRA Facility Investigation,						
	Occidental Chemical Corp	oration, Delaware City, D	elaware,						
	August 1998 - April 1999								
<u> </u>									
									
									
	<u> </u>								
☐ An Pos	Laborer Laborer	T D : 10							
	ruested	For Review and Comme	ent .						
For Yo									
For Re	view								
COMMENTS:									
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Copy to:	Alan Weston								
• •			1 : 0-						
Completed by:	Denise R. Tuhovak	Signed: 🛴	enis (X. Tuhanh						
Filing: Correspo	(Please Print)								

ANALYTICAL DATA ASSESSMENT AND VALIDATION
PHASE II – RCRA FACILITY INVESTIGATION
OCCIDENTAL CHEMICAL CORPORATION
DELAWARE CITY, DELAWARE
AUGUST 1998 – APRIL 1999

TABLE OF CONTENTS

			<u>Page</u>
1.0	INTROD	UCTION	1
2.0	SAMPLE	HOLDING TIMES	2
3.0		ROMATOGRAPH/MASS SPECTROMETER (GC/MS) AND MASS CALIBRATION - VOCS AND SVOCS	3
4.0	INSTRUM 4.1 4.1.1 4.1.2 4.2 4.2.1 4.2.2 4.3 4.3.1 4.3.2 4.3.3	MENT CALIBRATION	
5.0	SURROG	ATE SPIKE RECOVERIES - ORGANICS	
6.0	INTERNA	AL STANDARD RECOVERIES - VOCS AND SVOCS	10
7.0	METHOI	D BLANK ANALYSES	11
8.0	BLANK S	SPIKE ANALYSES - ORGANICS	12
9.0	LABORA	TORY CONTROL SAMPLE ANALYSES - INORGANICS	13
10.0		SPIKE/MATRIX SPIKE DUPLICATE D) ANALYSES - ORGANICS	
11.0		SPIKE ANALYSES - INORGANICS	
12.0	—DUPLICA	ATE-SAMPLE-ANALYSES - INORGANICS	16
13.0	ICP SERI	AL DILUTION	17
14.0	ICP INTE	REFERENCE CHECK SAMPLE ANALYSIS (ICS)	18

TABLE OF CONTENTS

		•	<u>Page</u>
15.0		ANEOUS	
	15.1 15.2	DUAL COLUMN CONFIRMATION OF HEXACHLOROBENZENE REPORTING OF SOIL RESULTS	
	15.3	TOTAL AND DISSOLVED METALS	
16.0	FIELD Q	A/QC	20
	16.1	FIELD DUPLICATES.	
	16.2	RINSE BLANKS	20
	16.3	TRIP BLANKS - VOCS (WATER SAMPLES ONLY)	20
17. 0	TICS - VC	OCS AND SVOCS	21
18.0	CONCLU	JSION	22

LIST OF TABLES

TABLE 1A	SAMPLE COLLECTION AND ANALYSIS SUMMARY - GROUNDWATER SAMPLES
TABLE 1B	SAMPLE COLLECTION AND ANALYSIS SUMMARY - SOIL/SEDIMENT SAMPLES
TABLE 1C	SAMPLE COLLECTION AND ANALYSIS SUMMARY - PIEZOMETER SAMPLES
TABLE 2	ANALYTICAL METHOD SUMMARY
TABLE 3A	ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES
TABLE 3B	ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES
TABLE 3C	ANALYTICAL RESULTS SUMMARY - PIEZOMETER SAMPLES
TABLE 4	QUALIFIED SAMPLE RESULTS DUE TO HOLDING TIME EXCEEDANCES
TABLE 5	QUALIFIED SAMPLE RESULTS DUE TO OUTLYING INITIAL CALIBRATION RESULTS
TABLE 6	QUALIFIED SAMPLE RESULTS DUE TO CONTINUING CALIBRATION RESULTS
TABLE 7	QUALIFIED SAMPLE RESULTS DUE TO OUTLYING CRDL RECOVERIES
TABLE 8	QUALIFIED SAMPLE RESULTS DUE TO OUTLYING SURROGATE RECOVERIES
TABLE 9	QUALIFIED SAMPLE RESULTS DUE TO OUTLYING INTERNAL STANDARD (IS) RECOVERIES
TABLE 10	QUALIFIED SAMPLE RESULTS DUE TO ANALYTE CONCENTRATIONS IN THE METHOD BLANKS
TABLE 11	QUALIFIED SAMPLE RESULTS DUE TO OUTLYING BLANK-SPIKE RESULTS
TABLE 12	QUALIFIED RESULTS DUE TO MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERIES
TABLE 13	QUALIFIED SAMPLE RESULTS DUE TO OUTLYING MATRIX SPIKE RECOVERIES

LIST OF TABLES (CONT'D.)

TABLE 14	QUALIFIED SAMPLE RESULTS DUE TO POOR LABORATORY DUPLICATE PRECISION
TABLE 15	QUALIFIED SAMPLE RESULTS DUE TO OUTLYING SERIAL DILUTIONS
TABLE 16	QUALIFIED SAMPLE RESULTS DUE TO DIFFERENCES IN DUAL COLUMN RESULTS
TABLE 17	QUALIFIED SAMPLE RESULTS DUE TO LOW PERCENT SOLIDS
TABLE 18	QUALIFIED SAMPLE RESULTS DUE TO VARIABILITY IN FIELD DUPLICATE RESULTS
TABLE 19	QUALIFIED SAMPLE RESULTS DUE TO ANALYTE CONCENTRATIONS IN THE RINSE BLANKS
TABLE 20	QUALIFIED SAMPLE RESULTS DUE TO ANALYTE CONCENTRATIONS IN THE TRIP BLANK
TABLE 21A	TENTATIVELY IDENTIFIED COMPOUNDS - WATER
TABLE 21B	TENTATIVELY IDENTIFIED COMPOUNDS - SOIL

1.0 <u>INTRODUCTION</u>

The following document details an assessment and validation of analytical results reported by H2M Labs, Inc. (H2M) for soil and groundwater samples collected in support of the Phase II RCRA Facility Investigation (RFI) at the Occidental Chemical Corporation Site in Delaware City, Delaware. The samples were collected from August 1998 through April 1999. Sampling and analysis summaries are presented in Tables 1A and 1B.

The samples collected were analyzed for one or more of the following parameters depending on the objective of the sampling: target compound list (TCL) volatile organic compounds (VOCs), TCL semi-volatile organic compounds (SVOCs), target analyte list (TAL) metals, cyanide, and various general chemistry parameters as detailed in Tables 1A and 1B. A summary of the analytical methodology is presented in Table 2. In addition to target compounds, tentatively identified compounds (TICs) were reported for the VOC and SVOC analyses.

Summaries of the analytical data are presented in Tables 3A, 3B and 3C. The quality assurance/quality control (QA/QC) criteria by which these data have been assessed are outlined in the analytical methods and the documents entitled:

- Region III Modification to National Functional Guidelines for Organic Data Review, Multi-Media, Multi-Concentration (OLM01.0-OLM01.9), September 1994;
- ii) Region III Modifications to the Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses", April 1993; and
- iii) "Occidental Chemical Corporation, RCRA Facility Investigation Quality Assurance Project Plan, Delaware City, Delaware", February 1997 (QAPP).

Full CLP-equivalent raw data deliverables were provided by the laboratory. The data quality assessment and validation presented in the following subsections were performed based on the sample results and supporting QA/QC provided.

2.0 <u>SAMPLE HOLDING TIMES</u>

The method-specific holding time criteria are summarized in Table 3-3 of the QAPP. All sample extractions and/or analyses were performed within the specified holding times with the following exceptions (see Table 4 for a summary of sample qualifications):

- i) fifteen samples were analyzed for total organic carbon (TOC) one to three days
 past the 14 day holding time. The associated sample results were qualified as
 estimated (L) to reflect potential loss of analyte;
- four samples were analyzed for mercury one day past the 28 day holding time.
 The associated sample results were qualified as estimated (L) to reflect potential loss of analyte;
- iii) ten samples were analyzed for sulfide one day past the 7 day holding time. The associated sample results were qualified as estimated (L) to reflect potential loss of analyte; and
- iv) five soil samples were re-extracted for SVOCs eight and nine days past the 14 day holding time. All SVOC results for these samples were qualified as estimated (J) to reflect potential loss of analytes.

All samples were properly preserved and cooled to 4°C(±2°C) after collection. All samples were received by the laboratory in good condition within two days of sample collection.

2

7462-DV-2

3.0 GAS CHROMATOGRAPH/MASS SPECTROMETER (GC/MS) TUNING AND MASS CALIBRATION - VOCs AND SVOCs

Prior to analysis, GC/MS instrumentation is tuned to ensure optimization over the mass range of interest. To evaluate instrument tuning, the VOC and SVOC methods require the analysis of the specific tuning compounds bromofluorobenzene (BFB) and decafluorotriphenylphosphine (DFTPP), respectively. The resulting spectra must meet the criteria cited in the method before analysis is initiated. Analysis of the tuning compound must then be repeated every twelve hours throughout sample analysis to ensure the continued optimization of the instrument.

Instrument tuning data were reviewed. All tuning criteria were met for the analyses, indicating proper optimization of the instrumentation. Tuning compounds were analyzed at the required frequency throughout the VOC and SVOC analysis periods, with the exception of one sample, SD-2 Dup, which was analyzed 12 minutes outside of the 12 hour tune window. This analysis was judged to be valid based on the minor extent of the time exceedance.

4.0 INSTRUMENT CALIBRATION

4.1 GC/MS CALIBRATION - VOCs AND SVOCs

4.1.1 <u>INITIAL CALIBRATION</u>

To quantify compounds of interest in samples, calibration of the GC/MS over a specific concentration range must be performed. Initially, a five-point calibration curve containing all compounds of interest is analyzed.

Linearity of the curve and instrument sensitivity were evaluated against the following criteria:

- i) all relative response factors (RRFs) must be greater than or equal to 0.05; and
- ii) percent relative standard deviation (%RSD) values must not exceed 30 percent.

The initial calibration data for VOCs and SVOCs were reviewed and all RRFs and %RSDs met the above criteria with the following exception: the %RSD for tetrachloroethene was 34 percent for one initial calibration, which did not meet the linearity requirement. Associated sample results for this compound, which were above the reporting limit, were qualified as estimated (J) (see Table 5).

4.1.2 <u>CONTINUING CALIBRATION</u>

To ensure that instrument calibration is acceptable throughout the sample analysis period, continuing calibration standards must be analyzed and compared to the initial calibration curve every 12 hours.

The following criteria were employed to evaluate continuing calibration data:

- i) all RRF values must be greater than or equal to 0.05; and
- ii) percent difference (%D) values must not exceed 25 percent.

Calibration standards were analyzed at the required frequency and the results met the above criteria for instrument sensitivity and linearity of response with the following exceptions (see Table 6 for a summary of sample data qualifications):

- i) %D values for some of the VOC compounds exceeded the 25 percent criterion. All associated sample results above the reporting levels were qualified as estimated (J) to reflect variability in instrument response. Non-detect data for these samples were judged to be acceptable;
- ii) %D values for VOCs 2-butanone, 2-hexanone and acetone were greater than 50 percent on various analysis dates, indicating significant changes in instrument response. All associated sample results were qualified as estimated;
- "D values for some SVOC compounds exceeded the 25 percent criterion. All associated sample results above the reporting limits were qualified as estimated (J) and all non-detect results were judged to be acceptable based on adequate instrument sensitivity; and
- iv) %D values for SVOCs 2,4-dinitrophenol, 4-nitrophenol and hexachlorocyclopentadiene showed a significant change in instrument response of greater than 50 percent on various analysis dates. All associated sample results were qualified as estimated (J) to reflect potential variability in these data.

4.2 GC CALIBRATION - HEXACHLOROBENZENE (WATER SAMPLES ONLY)

To ensure that instrument performance was acceptable throughout hexachlorobenzene analysis, the data were evaluated against method criteria for initial and continuing instrument calibration. Since the method requires dual column analysis of all samples, the criteria have been applied to both columns.

4.2.1 <u>INITIAL CALIBRATION</u>

To quantify compounds of interest, calibration of the GC/ECD over a specific concentration range must be performed. Initially, five-point calibration curves are analyzed. Linearity of the calibration curves is acceptable if all RSD values are less than or equal to 20.0 percent.

Retention time windows are also calculated from the initial calibration analyses. These windows are then used to identify the target compound in subsequent analyses.

All initial calibration standards were analyzed at the required frequencies. All retention time and linearity criteria were satisfied.

4.2.2 CONTINUING CALIBRATION

To ensure that the calibration of the instrument is valid throughout the sample analysis period, continuing calibration standards are analyzed and evaluated on a regular basis. After the initial calibration sequence, medium level standards are analyzed every twelve hours.

To evaluate the continued linearity of the calibration, %D values are calculated for each compound in all continuing standards and assessed against an acceptance criterion of 25 percent.

To ensure that compound retention times do not vary over the analysis period, all retention times for continuing calibration compounds must fall within the established retention time windows.

All continuing calibrations met the above criteria.

4.3 INORGANICS CALIBRATION

4.3.1 <u>INITIAL CALIBRATION</u>

Initial calibration of the instruments ensures that they are capable of producing satisfactory quantitative data at the beginning of a series of analyses. For trace inductively coupled plasma (ICP) analysis, a calibration blank and at least one standard must be analyzed at each wavelength to establish the analytical curve. For mercury analyses, a calibration blank and a minimum of four standards must be analyzed to establish the analytical curve. Total suspended solids (TSS) analysis is a gravimetric determination. Sulfide and hardness analyses are titrimetric analyses. These general

chemistry parameters do not require calibration curves. For the remaining general chemistry parameters, calibration is performed based on the analysis of five standards and a blank. Resulting correlation coefficients for curves consisting of a blank and three or more standards must be at least 0.995.

After calibration, an initial calibration verification (ICV) standard must be analyzed to verify the analytical accuracy of the calibration curves. All analyte recoveries from the analyses of the ICVs must be within the following control limits:

Analytical Method	Inorganic Species	Control Limits (Percent)				
ICP	Metals	90 - 110				
Cold Vapor AA	Mercury	80 - 120				
Various	General Chemistry	85 - 115				

Upon review of the data, it was determined that all inorganic calibration curves and ICVs were analyzed at the proper frequencies and that all of the above-specified criteria were met. The laboratory effectively demonstrated that instrumentation used for these analyses were properly calibrated prior to sample analyses.

4.3.2 <u>CONTINUING CALIBRATION</u>

To ensure that instrument calibration is acceptable throughout the sample analysis period, continuing calibration verification (CCV) standards are analyzed on a regular basis. Each CCV is deemed acceptable if all analyte recoveries are within the control limits specified above for the ICVs. If some of the CCV analyte recoveries are outside the control limits, samples analyzed before and after the CCV, up until the previous and proceeding CCV analyses, are affected.

For this study, CCVs were analyzed at the proper frequency. All analyte recoveries reported for the CCVs were within the specified limits.

4.3.3 CONTRACT REQUIRED DETECTION LIMIT (CRDL) STANDARD ANALYSES

To verify the linearity of the ICP calibration near the CRDL, a standard must be analyzed which contains specified ICP analytes at a concentration of two times the CRDL, or twice the instrument detection limit (IDL), whichever is greater. This standard must be analyzed at the beginning and end of each sample analysis run or a minimum of twice per eight hour working shift.

Region III control limits of 90 to 110 percent were used to evaluate the data. Several CRDL recoveries were marginally outside the control limits. A summary of sample qualifications is included in Table 7. For high CRDL recoveries, all associated detected sample results less than two times the CRDL were qualified as estimated to reflect a potential high bias (K). Non-detect data were not impacted by the indicated high bias. For low CRDL recoveries, all associated sample results less than two times the CRDL were qualified as estimated (L) to reflect a potential low bias.

5.0 SURROGATE SPIKE RECOVERIES - ORGANICS

In accordance with the methods employed, all samples, blanks, and standards analyzed for VOCs, SVOCs, and hexachlorobenzenes were spiked with surrogate compounds prior to sample extraction and/or analysis. Surrogate recoveries provide a means to evaluate the effects of individual sample matrices on analytical efficiency and are assessed against method control limits. For the SVOC method, it is acceptable for one surrogate recovery per fraction (base neutral or acid phenolic) to fall outside of these limits, provided it is greater than 10 percent.

All surrogate recoveries met the method criteria with the following exceptions (see sample qualification summary in Table 8):

- i) for VOC samples WB16 (6-8')DL, SED-6, A-37S, and SC-22, one surrogate had a slightly high recovery, and the remaining two surrogate recoveries for each of these samples were acceptable. Results for these samples which were above the reporting limit were qualified as estimated (J) to reflect a potential high bias;
- ii) VOC samples WB16 (6-8'), SB12 (12-14'), SB12GW, WB16 (6-8') Dup, A-25S, A-37D, A-38D, C-22, C-C23, C-24, and SW-10 had high recoveries for two out of three surrogates. In most cases, the high recoveries were a result of matrix interferences caused by high concentrations of organic compounds in the samples. All results for these samples above the reporting limits were qualified as estimated (K) to reflect a potential high bias;
- iii) high recoveries for two or more acid/phenolic surrogates were reported for groundwater sample SB-12 GW. Associated sample results above the reporting limit were qualified as estimated (K) to reflect a potential high bias. Non-detect data would not have been impacted;
- iv) low tetrachloro-m-xylene (TCMX) and decachlorobiphenyl (DCB) recoveries were reported for both gas chromatographic (GC) columns for the hexachlorobenzene samples A-29S field duplicate, A-23, A-32D, and SW-10. All associated results were non-detect and were qualified as low biases (L);
- various combinations of low recoveries for TCMX and/or DCB were reported on one or both GC columns. The associated sample data was qualified as estimated per the EPA Region III Guidelines (J or L); and
- vi) a high TCMX and low DCB recovery was reported for sample SB-11. The associated sample result was qualified as estimated (J) based on the variability demonstrated.

6.0 INTERNAL STANDARD RECOVERIES - VOCS AND SVOCS

To ensure that changes in GC/MS response and sensitivity do not affect sample analysis results, internal standard compounds are added to all samples, blanks, and spike samples prior to VOC and SVOC analyses. All results are calculated as a ratio of the internal standard response. The criteria by which the internal standard results are assessed are as follows:

- i) internal standard area counts must not vary by more than a factor of two (-50 percent to +100 percent) from the associated calibration standard; and
- ii) the retention time of the internal standard must not vary more than ±30 seconds from the associated calibration standard.

The sample IS results met the above criteria with the following exceptions (see Table 9 for sample results qualifications):

- i) the recoveries for the third VOC IS were slightly low (37 to 41 percent) for samples SED-11, SB-13, SB-13 Dup, SD-7, and C-22. All sample results for the compounds associated with this IS were qualified as estimated (J);
- the recoveries for the third VOC IS in samples WB16 (6-8'), WB16 (14-16'), A-35S, A-37S, and C-23 were very low (<25 percent) due to matrix interferences. The samples were diluted to reduce the matrix interferences and the IS recoveries were acceptable. Results for the compounds associated with this IS were reported from the diluted sample analyses, while the remaining results were reported from the original analyses;
- the VOC IS recoveries for the matrix spike (MS) of soil sample SS-11 were low and the resulting spike recoveries were outlying. The MS analysis was disregarded (see Section 10), and only the matrix spike duplicate (MSD) sample was used to assess analytical accuracy;
- iv) the sixth SVOC IS recovery for sample A-38D was extremely low (<25 percent).

 All associated compound results were non-detect and rejected due to the poor analytical response; and
- v) sample SS-12A exhibited low SVOC IS recoveries (37 and 33 percent) for two IS compounds. All associated compound results were qualified as estimated (J).

7.0 METHOD BLANK ANALYSES

The purpose of assessing the results of method blank analyses is to determine the existence and magnitude of sample contamination introduced during analysis. Method blanks are prepared from deionized water and analyzed as samples.

For this study, method blanks were analyzed at a minimum frequency of one per analytical batch and the data were non-detect with the following exceptions (see Table 10 for sample qualifications):

- i) low levels of methylene chloride, acetone, 2-hexanone, carbon disulfide, chlorobenzene, chloroform, and/or tetrachloroethene were detected in some of the VOC method blanks prepared and analyzed with the samples. Methylene chloride and acetone results in the associated samples at levels up to ten times the method blank concentrations were qualified to indicate a potential high bias (B). Chloroform, 2-hexanone, carbon disulfide, chlorobenzene, and tetrachloroethene results up to five times the blank concentrations were qualified (B);
- ii) low levels of bis-2(ethylhexyl)phthalate were detected in five of the method blanks prepared and analyzed with the groundwater samples. Associated sample results up to ten times these concentrations were qualified (B) to reflect a potential high bias; and
- low level concentrations of several metals were detected above the instrument detection limits (IDLs) in some of the continuing calibration blanks (CCBs) and preparation blanks. Sample results greater than the IDL but less than five times the amount detected in the associated blank were qualified (B) to reflect a potential high bias.

8.0 BLANK SPIKE ANALYSES - ORGANICS

Blank spikes are prepared and analyzed as samples to assess the analytical efficiencies of the method employed, independent of sample matrix effects. Blank spikes were performed for all organic parameters analyses and the results were acceptable for all compounds spiked with the following exceptions (see Table 11 for sample qualifications):

- i) low recoveries were obtained for the VOCs 2-butanone and 2-hexanone on February 2, 1999. Associated sample results were qualified as estimated (J);
- ii) high recoveries were obtained for chlorobenzene and benzene on February 3, 1999. Associated positive sample results were qualified as estimated (J) to reflect a potential high bias;
- iii) a low recovery was obtained for 2-hexanone on December 11, 1998. The recovery for this compound was also low in the associated sample matrix spike (see September 10, 1998). On this basis, overall accuracy for this compound was questionable and all associated sample results for 2-hexanone were qualified as estimated (J) to reflect a potential low bias.
- iv) some high SVOC recoveries were observed. All associated positive results were qualified as estimated (J) and all non-detect results would not have been affected by the potential high bias;
- v) some low SVOC recoveries were observed. All associated sample results were qualified as estimated (J) to reflect the potential low bias; and
- vi) 3,3'-dichlorobenzidine was not recovered in the blank spike extracted on August 24, 1998 and n-nitrosodiphenylamine exhibited an extremely low recovery in the blank extracted December 11, 1998. All associated sample results for these compounds were non-detect and rejected due to poor analytical efficiency.

9.0 LABORATORY CONTROL SAMPLE ANALYSES - INORGANICS

The laboratory control sample (LCS) serves as a monitor of the overall performance of all steps in the analysis, including the sample preparation. LCSs were analyzed using the same sample preparation, analytical methods, and QA/QC procedures employed for the investigative samples.

LCSs were reported for all inorganics analyses. All LCS samples yielded recoveries within the established control limits, indicating acceptable overall laboratory performance.

10.0 MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) ANALYSES - ORGANICS

MS/MSD samples are prepared and analyzed with each sample batch. The recoveries of MS/MSD analyses are used to assess the analytical accuracy achieved on individual sample matrices. The RPD between the MS and MSD is used to assess analytical precision. Samples chosen for MS/MSD analyses are specified in Tables 1A and 1B.

All MS/MSD recoveries showed acceptable accuracy and precision with the following exceptions (see Table 12):

- i) the MS VOC recoveries for sample SB13 were disregarded due to low IS recoveries (see Section 6.0). Analytical accuracy for this sample was based only on the MSD analysis;
- the VOC MS/MSD analyses of samples C-21, R-112, SS-11, and WB23 (4-6') yielded some low recoveries for target VOCs. The sample results for these compounds were qualified as estimated (J) to reflect a potential low bias. Overall accuracy for these compounds was judged to be acceptable based on the blank spike results; and
- iii) the VOC MS/MSD analyses of samples SW-2 and A-35S yielded high recoveries for some analytes. Results for these compounds in these samples were qualified as estimated (J) to reflect a potential high bias;
- iv) low SVOC MS and/or MSD recoveries were observed for various compounds.
 Sample results for these compounds were qualified as estimated (J) to reflect a potential low bias;
- v) variability was observed between some SVOC spike recoveries. The positive sample results for these compounds were qualified as estimated (J) and the non-detect results would not have been impacted by the variability;
- vi) SVOC 3,3'-dichlorobenzidine was not recovered in sample SW-2. Sample results for this compound were non-detect and rejected due to poor analyte efficiency; and
- -vii)—no-hexachlorobenzene-recoveries-were-obtained-for-the-MS/-MSD-of-sample-SB-13. Associated positive sample results were qualified as estimated (J) to reflect the potential low bias and associated non-detect results were rejected based on the poor analytical efficiency demonstrated.

11.0 MATRIX SPIKE ANALYSES - INORGANICS

To evaluate the effects of sample matrices on the digestion, measurement procedures, and accuracy of a particular analysis, samples are spiked with a known concentration of the analyte of concern and analyzed as MS samples. The established control limits for inorganic matrix spike recoveries are 75 to 125 percent. Spike recoveries are not assessed for samples having original concentrations significantly greater than the spike concentration (>four times).

Most spike recoveries met the above criteria. A summary of qualifications for samples associated with outlying MS recoveries is included in Table 13. Outliers were as follows:

- i) high copper, manganese, mercury, silver, and TOC MS recoveries were reported for some samples. All associated detected sample results were qualified as estimated (K) to reflect a potential high bias; and
- ii) low mercury, silver, antimony, cadmium, lead, and selenium MS recoveries were reported for some samples. Associated sample results were qualified as estimated (L) to reflect a potential low bias; and
- very low antimony MS recoveries (25 and 26 percent) were reported for the analysis of soil samples SS-11 and WB-23 (4-6'); all associated non-detect results were rejected and associated detected results were qualified as estimated (L) based on the poor analytical performance and demonstrated low bias.

12.0 DUPLICATE SAMPLE ANALYSES - INORGANICS

For inorganic parameters, analytical precision is evaluated based on the analysis of duplicate samples. For this study, duplicate samples were prepared and analyzed by the laboratory at the frequency specified in the QAPP.

Laboratory duplicate results are assessed against a maximum RPD of 35 percent for soil samples and 20 percent for groundwater samples. Metals sample results less than five times the CRDL are evaluated based on the difference between the sample and duplicate results, which should not exceed the CRDL for groundwaters and two times the CRDL for soils.

Most duplicate analyses met the above criteria. Detected sample results associated with outlying duplicate analyses were qualified as estimated (J) based on the indicated variability (see Table 14).

7462-DV-2

16

13.0 ICP SERIAL DILUTION

The serial dilution determines whether significant physical or chemical interferences exist due to sample matrix. A minimum of one per 20 investigative samples is analyzed at a five-fold dilution. For samples yielding analyte concentrations greater than 50 times the IDL, the serial dilution results must agree within 10 percent of the original results.

Serial dilutions were performed at the required frequency. Several serial dilution analyses showed potential interference. Associated sample results of significant concentration were qualified as estimated (J) (see Table 15).

14.0 ICP INTERFERENCE CHECK SAMPLE ANALYSIS (ICS)

To verify that proper inter-element and background correction factors have been established by the laboratory, ICSs are analyzed. These samples contain high concentrations of aluminum, calcium, magnesium, and iron and are analyzed at the beginning and end of each sample analysis period.

ICS analysis results were evaluated for all samples. All ICS recoveries were within the established control limits of 80 to 120 percent. Some false positives were detected, but the associated samples did not have comparable interferent levels and further evaluation was not necessary.

15.0 MISCELLANEOUS

15.1 <u>DUAL COLUMN CONFIRMATION OF HEXACHLOROBENZENE</u>

In accordance with the analytical method, samples are analyzed on two dissimilar columns and the lower of the two results is reported. Differences in the hexachlorobenzene results obtained from one column versus the other may be a reflection of interferences co-eluting with the analyte on one of the two columns. When significant differences were observed, the results were qualified as estimated (J) in the event that the differences in quantitation were caused by something other than co-eluting interferences (see Table 16).

15.2 <u>REPORTING OF SOIL RESULTS</u>

All soil results were reported on a dry-weight basis. Some soil samples contained greater than 50 percent moisture and since this can lead to variability in the analyses, all associated sample results were qualified as estimated (J) (see Table 17).

15.3 TOTAL AND DISSOLVED METALS

Based on a discrepancy in the total and dissolved zinc results for sample SW-8, both sample results have been qualified as estimated (J). A discrepancy was also noted in the original total and dissolved mercury results for sample A-17. A second sample was collected from this location on April 23, 1999, and analyzed for total and dissolved mercury. The results for the second set of samples were both non-detect, and are reported for sample A-17 in Table 3A.

16.0 FIELD QA/QC

16.1 FIELD DUPLICATES

To assess the analytical and sampling protocol precision, field duplicates (as identified in Tables 1A, 1B, and 1C) were collected and submitted "blind" to the laboratory. The RPD criteria specified in the QAPP were used to evaluate the data. Most results showed good precision for sampling and analytical procedures. Some field duplicate results for VOCs, SVOCs, TOC, TSS, various metals, and hexachlorobenzene exhibited variability, and the associated sample results were qualified as estimated (J) (see Table 18).

16.2 RINSE BLANKS

Rinse blank results identify possible contamination introduced during sample collection and/or analysis. Rinse blanks were collected at the frequency specified in the QAPP, and the results were non-detect with some exceptions.

All positive sample results at concentrations in the range of the rinse blank concentrations (within five times for most analytes and within ten times for common laboratory artifacts) were qualified (B) as summarized in Table 19.

16.3 TRIP BLANKS - VOCS (WATER SAMPLES ONLY)

Trip blanks are transported, stored, and analyzed with the investigative samples to identify potential cross-contamination of VOCs. Trip blanks were collected at the proper frequency, and all results were non-detect for the analytes of interest with the exception of some low level methylene chloride, tetrachloroethene, chlorobenzene, and acetone concentrations. Associated sample results at concentrations similar to the blank concentrations were qualified (B) to reflect a potential high bias (see Table 20).

17.0 TICS - VOCS AND SVOCS

Chromatographic peaks observed during volatile and semi-volatile sample analyses which are not target compounds, surrogates, or internal standards, are potential TICs. The ten largest TICs for the VOC analysis and 20 largest TICs for the SVOC analysis with areas greater than 10 percent of the area of the nearest internal standard are tentatively identified and quantitated.

Summaries of the TICs are presented in Tables 21A and 21B. TICs which were present in laboratory blanks or were identified as aldol condensation products were rejected and are not included in the tables.

18.0 <u>CONCLUSION</u>

Based on the assessment detailed in the foregoing, the data produced by H2M are acceptable with the specific exceptions and qualifications noted herein.

TABLE 1A

SAMPLE COLLECTION AND ANALYSIS SUMMARY - GROUNDWATER SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE AUGUST 1998 - APRIL 1999

Sample ID	Location	Date	Time	TCL VOCs	TCL SVOCs	HCB	TAL Metals (total)	TAL Metals (dissolved)	TSS	Chloride	Sulfate	Hardness
GW-7462-DJT-006	A-11A	12/02/98	0900	X	$\overline{\mathbf{x}}$	X	Х	X	X	Х	Х	
GW-7462-DJT-007	A-12	12/02/98	1000	X	Х	X	X	X	$\overline{\mathbf{x}}$	x	$\overline{\mathbf{x}}$	
GW-7462-DJT-008	A-13	12/02/98	0830	X	X	Х			П			
GW-7462-DJT-009	A-14	12/02/98	0930	X	$\overline{\mathbf{x}}$	\mathbf{x}		i —				
GW-7462-DJT-010	A-15	12/02/98	1100	X	X	$\overline{\mathbf{x}}$	_			П		
GW-7462-DJT-011	A-16	12/02/98	0845	X	X	X		ĺ				
GW-7462-DJT-001	A-17	12/01/98	1200	X	$\overline{\mathbf{x}}$	X	Х	X	X	X	X	
GW-7462-42399-BTF-A17	A-17RE	04/23/99	1215	П			X	X				
GW-7462-DJT-037	A-18	12/03/98	1 <i>7</i> 00	X	X	\mathbf{x}	X	X	X	Х	X	\Box
GW-7462-DJT-42	A-20	12/03/98	1600	X	X	$\overline{\mathbf{x}}$	X	X	X	Х	X	П
GW-7462-DJT-012	A-23	12/02/98	1145	X	X	X						
GW-7462-DJT-013	A-24	12/02/98	0945	X	X	\mathbf{x}						
GW-7462-DJT-44	A-25D	12/03/98	1600	X	X	X	Х	Х	Х	Х	Х	
GW-7462-DJT-43	A-25S	12/03/98	1530	X	X	X	X	X	X	X	X	П
GW-7462-DJT-002	A-26D	12/01/98	1245	X	\overline{X}	$\overline{\mathbf{x}}$	Х	Х	Х	Х	X	\neg
GW-7462-DJT-003	A-26OB	12/01/98	1415	X	X	X	Х	X	X	X	X	
GW-7462-DJT-004	A-26S	12/01/98	1530	X	\overline{X}	X	X	Х	X	X	$\overline{\mathbf{x}}$	コ
GW-7462-DJT-024	A-27D	12/03/98	1300	X	Χ	X	X	Х	X	Х	X	ᅦ
GW-7462-DJT-025	A-27S	12/03/98	1330	X	X	$\overline{\mathbf{x}}$	X	X	X	\mathbf{x}	$\overline{\mathbf{x}}$	ヿ
GW-7462-DJT-026	A-29D	12/02/98	1500	X	X	X	Х	Х	X	X	X	乛
GW-7462-DJT-27	A-29OB	12/02/98	1545	X	X	त्र	Х	Х	X	X	\mathbf{x}	ᄀ
GW-7462-DJT-28	A-29S	12/02/98	1600	X	X	\mathbf{x}	X	Х	X	$\overline{\mathbf{x}}$	\mathbf{x}	ヿ
GW-7462-DJT-21	A-29S	12/02/98	1530	X	Х	X	Χ	Х	Х	х	\mathbf{x}	ヿ
GW-7462-DJT-029	A-30D	12/03/98	0945	X	$\overline{\mathbf{x}}$	$\overline{\mathbf{x}}$	X	X	X	X	$\overline{\mathbf{x}}$	ᅥ
GW-7462-DJT-030	A-30OB	12/02/98	1630	X	Х	$\overline{\mathbf{x}}$	X	Х	х	Χ	Х	ㅓ
GW-7462-DJT-031	A-31D	12/03/98	0845	X	$\overline{\mathbf{x}}$	$\overline{\mathbf{x}}$	X	X	X		x	ᅥ
GW-7462-DJT-032	A-31OB	12/03/98	1000	X	X	X	χ	X	X	X	x	ㅓ

Comments

Mercury Only

MS/MSD

Duplicate of GW-7462-DJT-28

TABLE 1A

SAMPLE COLLECTION AND ANALYSIS SUMMARY - GROUNDWATER SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE AUGUST 1998 - APRIL 1999

Sample ID	Location	Date	Time	TCL VOCs	TCL SVOCs	НСВ	TAL Metals (total)	TAL Metals	(dissolved) TSS	Chloride	Sulfate	Hardness	Comments
GW-7462-DJT-33	A-32D	12/03/98	1030	X	Х	X	Х	· X	X	X	X		
GW-7462-DJT-35	A-32OB	12/03/98	0900		X		X	Х			Х		
GW-7462-DJT-36	A-32S	12/03/98	0945		Χ		Χ	Х	X	X	Χ		
GW-7462-DJT-34	A-32S	12/03/98	0930		X	_	X	Х			Χ		Duplicate of GW-7462-DJT-36
GW - 7462-DJT-38	A-33D	12/03/98	1645		Х		Χ	Х			Χ		
GW-7462-DJT-40	A-33S	12/03/98	1600		Х		X	X		_	X		
GW-7462-DJT-017	A-34D	12/02/98	1300		Х		Х	Х					
GW-7462-DJT-018	A-34S	12/02/98	1400		Х		X	Х			Χ		
GW-7462-DJT-019	A-35D	12/02/98	1445		Х		Х	X			Χ		
GW-7462-DJT-020	A-35S	12/02/98	1430		Х		X	Х			Χ		MS/MSD
GW-7462-DJT-022	A-36D	12/03/98	1245		Х		X	X			Χ		
GW-7462-DJT-023	A-36S	12/03/98	1200		Х		Χ	X			Χ		
GW-7462-DJT-046	A-37D	12/04/98	1045		X		X	Х		X	Χ		
GW-7462-DJT-047	A-37S	12/04/98	0945		Х		Х	X			Χ		
GW-7462-DJT-048	A-38D	12/04/98	0900		Х		Χ	X			Χ		
GW-7462-DJT-049	A-39D	12/04/98	0900	X	X	X	X	X	X	X	Χ		
GW-7462-DJT-045	A-39D	12/04/98	0845		Х	_	Х	Х			X		Duplicate of GW-7462-DJT-049
GW-7462-DJT-050	A-39S	12/04/98	0915		X		Х	Х	X	X	Χ		
GW-7462-DJT-014	A-6A	12/02/98	1200		X							_	
GW-7462-DJT-015	A-7A	12/02/98	1330		X								
GW-7462-DJT-016	A-8	12/02/98	1445		X		X	Х					
GW-7462-DJT-005	B-5	12/01/98	1530	ــــــــــــــــــــــــــــــــــــــ	Х	_	X	Х		X	X		
7462-12599-JG-C22	C-22	01/25/99	1100	X	X	X	Χ	X	X			Χ	
7462-12699-JG-C24	C-24	01/26/99	1300		X	_	Χ	X		J I		Χ	
GW-7462-DJT-051	R-110	12/04/98	1030	X	X	X	Χ	Х	X	Х	Χ		· .
GW-7462-DJT-041	R-112	12/04/98	0900		X		Χ	Х	X	X	Χ		MS/MSD
0111165 SB-10 GW	SB-10	08/12/98	1415	X	X	X							

TABLE 1A

SAMPLE COLLECTION AND ANALYSIS SUMMARY - GROUNDWATER SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE AUGUST 1998 - APRIL 1999

Sample ID	L	ocation	Date	Time	TCL VOCs	TCL SVOCs	НСВ	TAL Metals (total)	TAL Metals (dissolved)	TSS	Chloride	Sulfate	Hardness	Comments
0111166 SB-11 GV	V	SB-11	08/13/98	1030		X								
0111167 SB-12 GV	Ÿ	SB-12	08/14/98	0830		X	$\overline{\mathbf{x}}$							
0111170 SB-13		SB-13	08/18/98	1300	Χ									MS/MSD
0111171 SB-14		SB-13	08/18/98	1300	X									Duplicate of 0111170 SB-13
0111170 SB-13GW	, i	SB-13	08/19/98	1300		X	Χ							MS/MSD
0111171 SB-14		SB-13	08/19/98	1300			Х							Duplicate of 0111170 SB-13 GW
SW-1		SW-1	12/17/98	1505				Χ	Х	Х			Χ	
SW-2		SW-2	12/17/98	1145	X	X		X	Х	X			Χ	MS/MSD
SW-X		SW-2	12/17/98	1145	Х		Х	Χ	Х	X	į		X	Duplicate of SW-2
SW-3		SW-3	12/17/98	1305		Х		X	X	X			Χ	
SW-4		SW-4	12/16/98	1505	_	Х	_	Χ	Х	X			Χ	
SW-5		SW-5	12/16/98	1435	Х		Х	Χ	Х	X			Χ	
SW-6		SW-6	12/15/98	1450	X	Х	_	_X	X	X			Х	
SW-8	l	SW-8	12/15/98	1130		Х	_	X	Χ	X			X	
SW-9		SW-9	12/16/98	1355		Х		Х	Х	X			Χ	
7462-12699-JG-SW	1	SW-10	01/26/99	1500		X		_X	Х	Х			X	
7462-12699-JG-SW		SW-11	01/26/99	1430	Х	X	_	Χ	Χ	Х			Χ	
7462-12699-JG-SW	1	SW-12	01/26/99	1400		X	X	<u> </u>	Х	<u> X</u>			Х	
W-7462-2999-JG-T	В	-	02/09/99	-	Х					L				Trip Blank
0111240		-	·08/12/98	-	Χ	_				$oxed{oxed}$				Trip Blank
0111253		-	08/14/98	-	Х				<u> </u>		Ш			Trip Blank
0111252		-	08/18/98	-	Х						Ш		Ш	Trip Blank
0111251		-	08/19/98	-	X					L	Ш		Ш	Trip Blank
RB-7462-DJT-052	•	-	12/01/98	1600		Χ	Х	Χ	X	Х	Х	X		Rinse Blank
Trip Blank		-	12/01/98	-	Х		\Box							Trip Blank
RB-7462-DJT-053	<u>.</u>	-	12/02/98	1530		Χ	X							Rinse Blank
Trip Blank		-	12/02/98	-	χ			_						Trip Blank

TABLE 1A

SAMPLE COLLECTION AND ANALYSIS SUMMARY - GROUNDWATER SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE AUGUST 1998 - APRIL 1999

Sample ID	Location	Date	Time
•	Locuiton		
RB-7462-DJT-054	-	12/03/98	1400
Trip Blank	-	12/03/98	-
RB-7462-DJT-055	-	12/04/98	0800
Trip Blank	-	12/04/98	-
Trip Blank	-	12/17/98	-
SW-7462-12599-JG-RB	-	01/25/99	1600

$\times \times \times \times \times \times \times \times \times \times \times \times \times \times \times \times \times \times \times $	TCL SVOCs	HCB	TAL Metals (total)	TAL Metals (dissolved)	TSS	Chloride	Sulfate	Hardness
Χ	Χ	Χ	X	Х	Χ	Х	X	
Х								
Χ	Х	X	Χ	X	Χ	Х	X	
Χ								
Χ								
χ	Χ	Χ	Х	Х	χ			

Rinse Blank Trip Blank Rinse Blank Trip Blank Trip Blank Rinse Blank

Notes:

Not Applicable.

HCB Hexachlorobenzene.

MS Matrix Spike.

MSD Matrix Spike Duplicate.

SVOCs Semi-Volatile Organic Compounds (includes 1,2-Diphenylhydrazine).

RE Denotes sample recollection.

TAL Target Analyte List.

TCL Target Compound List.

TSS Total Suspended Solids.

VOCs Volatile Organic Compounds.

TABLE 1B

SAMPLE COLLECTION AND ANALYSIS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE **AUGUST 1998 - APRIL 1999**

Sample ID	Location	Date	Time	TCL VOCs	TCL SVOCs	HCB	TOC Metals	Sulfide	Ammonia	Grain Size	Methyl Mercun	Mercury	Comments
7462-92498-BTF-A34S	A-34S (19-21)	09/24/98	1330				T					X	
7462-11399-JAG-C21	C-21	01/13/99	1300	X			XΣ				X		MS/MSD
7462-11399-JAG-C26	C-21	01/13/99	1500	X		X :	X >				X		Duplicate of 7462-11399-
7462-11399-JAG-C27	C-21C	01/13/99	-	X		X	XX	X	X	X	X		Sample submitted in the sa
C-7462-12599-JG-C22	C-22	01/25/99	1100	X			XX	X	X		X		
C-7462-12699-JG-C20	C-C20	01/26/99	1200	X		X	XX	X	X	X	X		
C-7462-12599-JG-C23	C-C23	01/25/99	1300	X		X	XX	X	X	X	X	П	
C-7462-12699-JG-C24	C-C24	01/26/99	1300	X		X	XX		X	X	X		
C-7462-12599-JG-C25	C-C25	01/25/99	1500	X	X	X :	XX	X	X	X	X		
0111017 SB-10 (2-4)	SB-10 (2-4)	08/12/98	1246	X	X	X :	XX						
0111018 SB-11 (6-8)	SB-11 (6-8)	08/13/98	0930	X	X	X	XX						
0111019 SB-12 (12-14)	SB-12 (12-14)	08/13/98	1430	X			XX			Π			
0111024 SB-13 (0-2)	SB-13 (0-2)	08/18/98	1000	X		X :	XX						
S-7462-12699-JG-C22	S-C22	01/25/99	1100			X Z			X		X		
S-7462-12699-JG-C24	S-C24	01/26/99	1300			X Z	XX	X	X	X	X		
0111085 SED-1	SED-1	08/06/98	0900	X	X	X :	X						MS/MSD
0111086 SED-2	SED-2	08/05/98	1600	X		X	X				383		
0111087 SED-3	SED-3	08/05/98	1535	X		X :	X				No.		
0111090 SED-4	SED-4	08/05/98	1315			X :	X				- 4	П	
0111104 SED-5	SED-5	08/04/98	1245	X	X	X	X						
0111088 SED-6	SED-6	08/05/98	1500	X		X :	X					П	
0111089 SED-7	SED-7	08/05/98	1405	X	X	X :	X					П	
0111105 SED-8	SED-8	08/04/98	1050	X			X					П	
0111084 SED-9	SED-9	08/06/98	0930	X	X	X :	Χİ	1			T	П	
0111083 SED-10	SED-10	08/06/98	1000	X	X	X	X					П	
0111082 SED-15	SED-10	08/06/98	1000	X		X :	X		Т			П	Duplicate of 0111083 S
0111081 SED-11	SED-11	08/06/98	1035	X		X :		1				П	
0111080 SED-12	SED-12	08/06/98	1050	X	Χ	X Z	X						

9-JAG-C21 sample core.

SED-10

TABLE 1B

SAMPLE COLLECTION AND ANALYSIS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE AUGUST 1998 - APRIL 1999

Sample ID	Location	Date	Time	TOT VOC	TCL SVOCs	НСВ	TAL Metals	TOC	Sulfide	Ammonia	Grain Size	Metnyt Mercu	Mercing Comments
0111079 SED-13	SED-13	08/06/98	1100	7	₹ X	X	X	ヿ	ヿ	7	十	\top	
0111076 SED-14	SED-14	08/06/98	1310		(X	X	X		T			Т	
SD-1	SD-1	12/17/98	1450	7	(X		X	X	ХĪ	X [X Z	ΧŢ	
SD-2	SD-2	12/17/98	1225	[5			X	X	ХĪ	\mathbf{x}	\mathbf{x}	ΧĪ	MS/MSD
SD-X	SD-2	12/17/98	1225	7			X	X	ХĪ	X :	\mathbf{x}	ХŢ	Duplicate of SD-2
SD-3	SD-3	12/17/98	1320		(X			X			\mathbf{x}	ΧŢ	
SD-4	SD-4	12/16/98	1515		(X		X	X	ХŢ	X :	XI:	ΧŢ	
SD-5	SD-5	12/16/98	1435		₹ X		X	X	ञ	\mathbf{x}	$\overline{\mathbf{x}}$	\overline{x}	Π
- SD-6	SD-6	12/15/98	1525	[7	X		X	X	$\overline{\mathbf{x}}$	X :	X Z	X	
SD-7	SD-7	12/15/98	1425		₹ X		X	X	$\overline{\mathbf{x}}$	$\overline{\mathbf{X}}$	XT:	X	
SD-8	SD-8	12/15/98	1230		⟨ X		X	X	ХĪ	X :	X :	\overline{x}	
SD-9	SD-9	12/16/98	1410	[<u>7</u>	(X		X	X	\mathbf{x}	X :	X Z	ΧŢ	
0111097 SS-11	SS-11	08/05/98	0940	<u> </u>			X	ΧŢ	T	T		Т	MS/MSD
0111096 SS-11A	SS-11A	08/05/98	0950	7			X	X	\neg	T	\neg	\top	
0111093 SS-12	SS-12	08/05/98	1045	[7	⟨ X		X	X				T	
0111092 SS-12B	SS-12	08/05/98	1045	[7	(X	X	X	X			Т	T	Duplicate of 0111093 SS-12
0111091 SS-12A	SS-12A	08/05/98	1100	\Box	(X	X	X	X	\neg		Ţ	Т	
0111103 SS-13	SS-13	08/04/98	1400	[7	X	X	X	X					
0111102 SS-14	SS-14	08/04/98	1445	<u> </u>	(X	X	X	X	П		П	Т	∏.
0111101 SS-15	SS-15	08/04/98	1505	7	$\langle \hat{\mathbf{x}} $	X	X	$\overline{\mathbf{x}}$	П	П	T	Т	
0111099 SS-16	SS-16	08/04/98	1545	Ŋ	(X	X	X	X	\Box		T	ŀ	<u> </u>
0111100 SS-17	SS-17	08/04/98	1525	- [7	(X	X	X	X	T	丁		T	
0111098 SS-18	SS-18	08/04/98	1555	- 17	₹ X	X	X	X	ヿ	T	T	T	
0111052 WB-14 (6-8)	WB-14 (6-8)	08/19/98	. 1100	7	(X	X	Х	X	T	T	_	1	
0111035 WB-15 (8-10)	WB-15 (8-10)	08/25/98	1215	7	(X		_		寸	T	丁	寸	
0111051 WB-16 (6-8)	WB-16 (6-8)	08/19/98	1415			X	X		1	T	\top	十	
0111050 WB-16 (14-16)	WB-16 (6-8)	08/19/98	1415	7	ďΧ	X	X	\mathbf{x}	寸	T	7	十	Duplciate of 0111051 WB-16 (6-8)
0111054 WB-17 (0-2)	WB-17 (0-2)	08/19/98	0845		X	_	_		1			1	MS/MSD

TABLE 1B

SAMPLE COLLECTION AND ANALYSIS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE AUGUST 1998 - APRIL 1999

Sample ID	Location	Date	Time	TCL VOCs	TCL SVOCs	нсв	FAL Metals	TOC	sulfide	Ammonia	Methal Mercur	Mercuru	Comments
0111053 WB-17 (6-8)	WB-17 (6-8)	08/19/98	0915	X			$\overline{\mathbf{x}}$			7	+	4~	
0111056 WB-18 (0-2)	WB-18 (0-2)	08/18/98	1400	<u>^</u>			$\frac{2}{x}$		-	+	+	┿	4
0111055 WB-18 (8-10)	WB-18 (8-10)	08/18/98	1420	^ x			$\frac{2}{X}$		+	+	╁	╁	-
0111035 WB-19 (0-10) 0111045 WB-19 (0-2)	WB-19 (0-2)	08/20/98	1425	Î			x		┽	+		╬	4
0111044 WB-19 (8-10)	WB-19 (8-10)	08/20/98	1500	\hat{x}			$\frac{2}{x}$		+	+	+	+-	-
0111043 WB-19 (14-16)	WB-19 (8-10)	08/20/98	1500	x			$\frac{\hat{x}}{x}$		+	+	+	┿	Duplicate of 0111044 WB-19 (8-10)
0111038 WB-20 (8-10)	WB-20 (8-10)	08/24/98	0955	Ιχ			$\frac{\lambda}{X}$		+	+	┰	┿	Duplicate of 0111044 WB-19 (8-10)
0111039 WB-21 (6-8)	WB-21 (6-8)	08/24/98	0915	X			X		+	+	┿	╢	·
011049 WB-22 (2-4)	WB-22 (2-4)	08/19/98	1545	X			$\frac{\lambda}{X}$		┰		╌	╈	-
011048 WB-23 (4-6)	WB-23 (4-6)	08/20/98	1020		X				+			╈	MS/MSD
0111036 WB-24 (4-6)	WB-24 (4-6)	08/24/98	1320		Х				╅	†		╂-	14107 14102
0111037 WB-25 (4-6)	WB-25 (4-6)	08/24/98	1100		х				╅	+	\top	╈	1
0111047 WB-26 (0-2)	WB-26 (0-2)	08/20/98	1245	X			\mathbf{x}		+	+	╅		1
0111046 WB-26 (6-8)	WB-26 (6-8)	08/20/98	1340		X				+	+	+	+	†
0111058 WB-27 (0-2)	WB-27 (0-2)	08/17/98	1400		Х				+	+	+	+	†
0111057 WB-27 (6-8)	WB-27 (6-8)	08/17/98	1445		X				+	+	\top	T	
0111060 WB-28 (0-2)	WB-28 (0-2)	08/17/98	1255		X				十	十	\top	T	1
0111059 WB-28 (4-6)	WB-28 (4-6)	08/17/98	1315		х				1	✝	+	T	1
0111062 WB-29 (0-2)	WB-29 (0-2)	08/17/98	1045		х				\top	╅		T	1
0111061 WB-29 (4-6)	WB-29 (4-6)	08/17/98	1100		X				\top	十		+	1
0111022 WB-30 (0-2)	WB-30 (0-2)	08/14/98	1305		Х				十	T	1	T	1
0111023 WB-30 (4-6)	WB-30 (4-6)	08/14/98	1325	X			X :		T	十	7	+-	1
0111020 WB-31 (0-2)	WB-31 (0-2)	08/14/98	1033	X	X				十	十	1	1	1
0111021 WB-31 (2-4)	WB-31 (2-4)	08/14/98	1105	X	Х	\mathbf{x}	X :	X	Ť	T		1	1
· 0111064 WB-32 (0-2)	WB-32 (0-2)	08/17/98	0900	X	X	\mathbf{x}	\mathbf{x}	хl	十	十	†-	1	1
0111063 WB-32 (4-6)	WB-32 (4-6)	08/17/98	0955		$\overline{\mathbf{x}}$				T	十	十	†-	1
0111025 FBLK-8/20/98	-	08/20/98	0800		X		x		Ť	十	╈	1	Field Blank
0111026 RNSBLK-8/20/98 .	-	08/20/98	0815	X	X		X	丁	T	T	T	Τ	Rinse Blank

TABLE 1B

SAMPLE COLLECTION AND ANALYSIS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE AUGUST 1998 - APRIL 1999

Sample ID	Location	Date	Time	TCL VOCs	TCL SVOCs	HCB	TAL Metals	TOC	Sulfide	Ammonia	Grain Size	Methyl Merc	Mercury	Comments
0111000 FBLK-8/25/98	-	08/25/98	0845	X	X		Х	X						Field Blank
0111001 RNSBLK-8/25/98	-	08/25/98	0900	X	X		Х	X						Rinse Blank
Sediment Rinse Blank	-	12/17/98	1025	Х	X		Х	X	X	Х	Х	X		Rinse Blank
C-7462-12599-JG-RB	-	01/25/99	1600	X	X	X	Х	X	Х	Х	Х	X		Rinse Blank
S-7462-12699-BTF-RB	<u>-</u>	01/26/99	1000	X										Rinse Blank
0111094 RNSBLK-8/5/98	-	08/05/98	1025	X	<u> X</u>		Х	X						Rinse Blank
0111095 FBLK-8/5/98	-	08/05/98	1015	X	\mathbf{x}		X	X						Field Blank
0111077 RNSBLK-8/6/98	-	08/06/98	1255	X	X		X							Rinse Blank
0111078 FBLK-8/6/98	-	08/06/98	1245	X	X		X				Ĺ			Field Blank

Notes:

Not Applicable.

MS Matrix Spike.

MSD Matrix Spike Duplicate.

SVOCs Semi-Volatile Organic Compounds (includes 1,2-Diphenylhydrazine).

TAL Target Anlayte List.

TCL Target Compound List.

VOCs Volatile Organic Compounds.

HCB Hexachlorobenzene.

TOC Total Organic Carbon.

TABLE 1C

SAMPLE COLLECTION AND ANALYSIS SUMMARY - PIEZOMETER SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE AUGUST 1998 - APRIL 1999

Sample ID	Location	Date	Time	TCL VOCs	TCL SVOCs	НСВ	TAL Metals	TAL Metals	(dissolved)	TSS	Chloride	Sulfate	Hardness
W-7462-2999-JG-PZ2	PZ-2	02/09/99	1425	Х						X	X	Х	П
W-7462-2999-JG-PZ10	PZ-2	02/09/99	1445	X				T		Χ	Х	X	
W-7462-21199-JG-PZ2	PZ-2	02/11/99	1400			Χ							
W-7462-21299-JG-PZ2	PZ-2	02/12/99	1210				Х						П
W-7462-21299-JG-PZ10	PZ-2	02/12/99	1220	П		Х	Х		\neg				П
W-7462-21599-JG-PZ2	PZ-2	02/15/99	1030					7	\Box				П
W-7462-21599-JG-PZ10	PZ-2	02/15/99	1040	П				7					П
W-7462-21099-JG-PZ-2	PZ-2	02/10/99	1400		Χ								
W-7462-21099-JG-PZ-10	PZ-2	02/10/99	1425	П	Х			П	\neg				П
W-7462-2999-JG-PZ3	PZ-3	02/09/99	1455	X	·			T	\neg	Χ	Х	X	П
W-7462-21199-JG-PZ3	PZ-3	02/11/99	1345			Х			\neg				
W-7462-21299-JG-PZ3	PZ-3	02/12/99	1200				Х	7					
W-7462-21099-JG-PZ-3	PZ-3	02/10/99	1350		Χ				ヿ				
W-7462-2999-JG-PZ4	PZ-4	02/09/99	1405	X						X	X	X	
W-7462-21199-JG-PZ4	PZ-4	02/11/99	1330	П		Х			一				
W-7462-21299-JG-PZ4	PZ-4	02/12/99	1150	П			X		T				П
W-7462-21599-JG-PZ4	PZ-4	02/15/99	1020	П		\Box		7	\Box			П	
W-7462-21099-JG-PZ-4	PZ-4	02/10/99	1335	П	X		-		T			П	П
W-7462-2999-JG-PZ5	PZ-5	02/09/99	1345	X		\neg		Т	\neg	X	$\overline{\mathbf{x}}$	X	\Box
W-7462-21199-JG-PZ5	PZ-5	02/11/99	1315			X	Х	T	丁		╗		П
W-7462-21299-JG-PZ5	PZ-5	02/12/99	1140	П				7	디		コ		
W-7462-21099-JG-PZ-5	PZ-5	02/10/99	1320	П	X		-			Ì	╗	\Box	
W-7462-2999-JG-PZ6	PZ-6	02/09/99	1120	X					╗			T	
W-7462-21199-JG-PZ6	PZ-6	02/11/99	1020	П		X			\dashv	\neg	\neg	\dashv	\Box
W-7462-21299-JG-PZ6	PZ-6	02/12/99	1030	П			Х	7	d	一	寸	ヿ	\Box
W-7462-21099-JG-PZ-6	PZ-6	02/10/99	1015	П	X					X	$\overline{\mathbf{x}}$	X	\Box
W-7462-2999-JG-PZ7	PZ-7	02/09/99	1200	X						Х	X	Х	

Comments

Duplicate of W-7462-2999-JG-PZ2

Duplicate of W-7462-21599-JG-PZ2

Duplicate of W-7462-21099-JG-PZ-2

Comments

TABLE 1C

SAMPLE COLLECTION AND ANALYSIS SUMMARY - PIEZOMETER SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE AUGUST 1998 - APRIL 1999

Sample ID	Loc	ation I	Date T	ime
W-7462-21299-JG-P	Z7 P	Z-7 02/	¹ 2/99 1	1010
W-7462-21599-JG-P2	Z7 P	Z-7 02/	['] 15/99 ()945
W-7462-21099-JG-P	Z-7 P	Z- 7 02/	['] 10/99 1	1035
W-7462-2999-JG-PZ	8 P	Z-8 02/	'09/99 1	100
W-7462-21199-JG-P2	Z8 P	Z-8 02/	11/99 1	125
W-7462-21299-JG-P2	Z8 P	Z-8 02/	12/99 1	1045
W-7462-21099-JG-P2	Z-8 P	Z-8 02/	10/99 1	500
W-7462-2999-JG-PZ	9 P	Z-9 02/	09/99 1	325
W-7462-21199-JG-P2	Z9 P.	Z-9 02/	11/99 1	300
W-7462-21299-JG-P2	Z9 P.	Z-9 02/	12/99 1	130
W-7462-21099-JG-P2	Z-9 P.	Z-9 02/	10/99 1	305

TCL VOCs	TCL SVOCs	HCB	TAL Metals	(total)	TAL Metals	(dissolved)	TSS	Chloride	Sulfate	Hardness
		Χ	^	(
						ζ .				
	Х									
Х							Х	Х	Х	
		Х		_						
			_ >	\cap		(
	Х									Ī
Х							Χ	Χ	Х	
			^	(
		Χ)					
	X	X								

Notes:

Not Applicable.

HCB Hexachlorobenzene.

MS Matrix Spike.

MSD Matrix Spike Duplicate.

SVOCs Semi-Volatile Organic Compounds (includes 1,2-Diphenylhydrazine).

TAL Target Analyte List

TCL Target Compound List.

TSS Total Suspended Solids.

VOCs Volatile Organic Compounds.

TABLE 2

ANALYTICAL METHOD SUMMARY PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE AUGUST 1998 - APRIL 1999

Sampling Analytical Analytical Analytica	
Activity Parameters Method	!
Groundwater Analysis	
TCL VOCs plus TICs 8260 (1)	1
Hexachlorobenzene 8081A (1	
TCL SVOCs plus TICs 8270 (1)	•
TAL Metals, total and dissolved (except mercury) 6010A (1	
Mercury, total and dissolved 7470A (1	•
TSS 160.2 (2)	•
Hardness 130.2 (2))
TOC 9060 (1)	·
Chloride EPA 325.2	(2)
Sulfate EPA 375.2/37	5.4 (2)
Soil Characterization	
TCI VOCa phys TICs	
TCL VOCs plus TICs 8260 (1) TCL SVOCs and Hexachlorobenzene plus TICs 8270 (1)	
TAL Metals, total (except mercury) 6010A (1)	
Mercury 7471A (1	•
TOC Lloyd Kahr	•
Ammonia 350.1 (2)	• •
Sulfide 9030A (1	
Grain Size ASTM 0422-63/0	•
Notes:	
	-i1 Moth o doll
(1) Referenced from "Test Methods for Evaluating Solid Waste, Physical/Chem SW-846, Third Edition, November 1986 (with all subsequent revisions).	ilcai Medious ,
(2) Referenced from "Methods for Chemical Analysis of Water and Wastes",	
EPA-600/4-79-020, March 1983.	
(3) Referenced from "Determination of Total Organic Carbon in Sediment", pre	nared by
Lloyd Kahn of the USEPA-Region II, July 1988.	Pared by
(4) Referenced from the Annual Book of ASTM Standards.	
SVOCs Semi-Volatile Organic Compounds.	
TAL Target Analyte List.	
TCL Target Compound List.	
TOC Total Organic Carbon.	
TSS Total Suspended Solids.	
VOCs Volatile Organic Compounds.	

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 1 (a) Date Printed: May 12, 1999 Time Printed: 2:21 pm

Sample Location:	<u> </u>	A-8	A-11A	A-12	A-13	A-14	A-15	A-16	A-17	
Sample Date:		12/02/1998	12/02/1998	12/02/1998	_12/02/1998_	12/02/1998	12/02/1998	12/02/1998	12/01/1998	
										
Parameters ·	Units									
I didiloters	<u> </u>									
TCL Volatiles										
TOD TOMINOS	1									
Chloromethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	<i>2</i> 1 .
Bromomethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	2000 2000
Vinyl chloride Chloroethane	ug/L ug/L	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	A.
Methylene chloride	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	1 B	3.0
Acetone	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	2000 800 8
Carbon disulfide	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
1,1-Dichloroethene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
1,1-Dichloroethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	88.3
1,2-Dichloroethene (total) 2-Butanone (MEK)	ug/L	ND 10 ND 10	* ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10	4.60°
Chloroform	ug/L ug/L	ND 10	ND 10	ND 10	01 DN	01 DN	ND 10	ND 10	ND 10 ND 10	900, 00
1,2-Dichloroethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	6 1	94
1,1,1-Trichloroethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	1.50.5
Carbon tetrachloride	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	0404
Bromodichloromethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	01 DN	Š.
1,2-Dichloropropane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	e.
cis-1:3-Dichloropropene	ug/L	ND to	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	3: 1 2000
Trichloroethene Benzene	ug/L ug/L	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 9 J	ND 10 ND 10	ND 10	-6 y
Dibromochloromethane	ug/L	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10	ND 10 ND 10	0.0
trans-1,3-Dichloropropene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	(§)
1,1,2-Trichloroethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	Save
Bromoform	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	654 655
4-Methyl-2-pentanone (MIBK)	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	a ca
2-Hexanone Tetrachloroethene	ug/L	ND 10 ND 10	ND 10	ND IO	ND 10 ND 10	ND 10	ND 10	ND 10	ND 10	2
1, 1, 2, 2-Terrachloroethane	ug/L ug/L	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10 ND 10	9 J ND 10	ND 10 ND 10	4 J ND 10	622 ·
Toluene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	<i>20</i> 2
Chlorobenzene	ug/L	ND 3	ND 3	ND 3	ND 3	ND 3	ND3	ND3	ND 3	50% 2005
Ethylbenzene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	200.
Styrene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND:10	3
Xylenes (total)	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
TCL Semi-volatiles										
TOD Some-volutions										
Phenol	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	e.
Bis(2-chloroethyl)ether	ug/L	ND 1	ND I	ND I	ND I	ND I	ND I	ND I	ND I	A5211
2-Chlorophenol	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	5.X
1,3-Dichlorobenzene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10 ·	
	1									

IV:\DBASEGRP\CHEM\7000\7462\Sc) Anal - GW - Target Analyses

05/10/99

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION

DELAWARE CITY, DELAWARE **AUGUST 1998 - APRIL 1999**

Date Printed: May 12, 1999

Page 1 (b)

Sample Location: A-8 A-11A A-12 A-13 A-14 A-15 A-16 A-	A-17
Sample Date: 12/02/1998	/01/1998
<u>Parameters</u> <u>Units</u>	
- Child	
TCL Semi-volatiles (Cont'd)	
1;4-Dichlorobenzene ug/L ND 10	ND 10
1,2-Dichlorobenzene ug/L ND 10	ND 10
2-Methylphenol ug/L ND:10 ND:10 ND:10 ND:10 ND:10 ND:10 ND:10 ND:10 N	ND 10
2.2:-Qxybis(1-chloropropane) ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 N	ND 10
	ND 10
	ND 10
Hexachloroethane ug/L ND 10	ND 10
National Sales (Market Control of	ND 10
	ND IO
	ND 10 ND 10
	ND 10 ND 10
	ND 10
	ND 10
	ND 10
4-Chloroaniline ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 N	ND 10
Hexachlorobutadiene ug/L ND 10	ND 10
4-Chloro-3-methylphenol ug/L ND 10 N	ND 10
2-Methylnaphthalene ug/L ND 10 ND 10 ND 10 ND 10 ND 10 2 I ND 10 N	ND 10
Hexachlorocyclopentadiene ug/L ND 10 ND	ND 10
2.4.6-Teichlorophenot	ND 10
2.4.5-Trichlorophenol ug/L ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 N	ND 25
2-Chloronaphthalene ug/L ND 10	ND 10
	ND 25
Dimethyl phthalate ug/L ND 10	ND IO
The state of the s	ND 10
	ND 10
1000000000000000000000000000000000000	ND 25
	ND 10 ND 25
	ND 25 ND 25
	ND 10
2022000000000000000000000000000000000	ND 10
**************************************	ND 10
	ND 10
	ND 10
$ \times$ \times \times \times \times \times \times \times \times \times	ND 25
	ND 25
$V_2 \otimes V_3 \otimes V_4 \otimes V_5 \otimes V_6 $	ND 10
	ND 10

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

Page 1 (c)

Date Printed: May 12, 1999

Time Printed: 2:21 pm

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION

DELAWARE CITY, DELAWARE **AUGUST 1998 - APRIL 1999**

Sample Location: Sample Date:		A-8 12/02/1998	A-11A 12/02/1998	A-12 12/02/1998	A-13 12/02/1998	A-14 12/02/1998	A-15 12/02/1998	A-16 12/02/1998	A-17 12/01/1998	
<u>Parameters</u>	<u>Units</u>									
TCL Semi-volatiles (Cont'd)						•				•
Pentachlorophenol Phenanthrene	ug/L ug/L	ND 25 ND 10	ND 25 ND 10	ND 25 ND 10	ND 25 ND 10	ND 25 ND 10	ND 25 ND 10	ND 25 ND 10	ND 25 ND 10	
Anthracene Carbazole Di-n-butyl phthalate	ug/L ug/L ug/L	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	
Fluoranthene Pyrene Butylbenzylphthalate	ug/L ug/L ug/L	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	
Benzo(a)antiracene 3,3'-Dichlorobenzidine	ug/L ug/L	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	
Chrysene Bis(2-ethylhexyl)phthalate Di-n-octyl phthalate	ug/L ug/L ug/L	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	ND 10 2 B ND 10	
Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene	ug/L ug/L ug/L	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	ND 10 ND 10 ND 10	######################################
Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene	ug/L ug/L	ND I ND 1	ND I ND I	ND I ND I	ND I ND I	ND I ND I	ND I ND 1	ND 1 ND 1	ND I ND I	
Benzo(g,h,i)perylene 1,2-Diphenyl-hydrazine	ug/L ug/L	ND 10 ND 1	ND 10 ND 1	ND 10 ND 1	ND 10 ND 1	ND 10 ND 1	ND 10 ND 1	ND 10 ND 1	ND 10 ND 1	
Hexachlorobenzene TAL Metals	ug/L	ND 0,025	ND 0.025 L	ND 0.025	ND 0.025	ND 0,025	ND 0.025	ND 0.025	ND 0.025 J	
Aluminum Aluminum, dissolved	ug/L	100	16 B	ND 5.4	•-		5 5.7500 - 2 575 00 - -	 Vancous accomunication des descri	18 B	.nnenecaa antiiatavast, tasu vanana k
Antimony Antimony, dissolved	ug/L ug/L ug/L	ND 5.4 ND 3.1 ND 3.1	ND 5.4 ND 3.1 ND 3.1	ND 5.4 ND 3.1 ND 3.1		— —	- 	-	ND 5.4 ND 3.1 ND 3.1	
Arsenic Arsenic, dissolved Barium	ug/L ug/L ug/L	ND 1.4 L ND 1.4 16	ND 1.4 L ND 1.4 21	ND 1.4 L 1.9 78	 	- -		 	ND 1.4 L ND 1.4 290	
Barium, disso)ved Beryllium Beryllium, dissolved	ug/L ug/L ug/L	14 ND 0.20 ND 0.20	21 0.20 ND 0.20	72 ND 0.20 ND 0.20	-	-	-	 	280 ND 0.20	
Cadmium Cadmium, dissolved	ug/L ug/L	0.46 B ND 0.30	0,77 B 0.34	0.30 B ND 0.30			-	 	ND 0.20 ND 0.30 ND 0.30	
Calcium Calcium, dissolved + Chromium	ug/L ug/L ug/L	37000 35000 ND 0.60	120000 120000 ND 0.60	51000 48000 ND 0,60	 	 		 	40000 38000 ND 0.60	
							•			•

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05/10/99

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

Page 1 (d)

ND 0.60

100000 J

97000

ND 1 R

Date Printed: May 12, 1999

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PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION

DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Sample Location: A-8 A-11A A-12 A-13 A-14 A-15 A-16 A-17 12/02/1998 12/02/1998 12/02/1998 12/02/1998 12/02/1998 12/02/1998 12/02/1998 12/01/1998 <u>Units</u> TAL Metals (Cont'd) Chromium, dissolved ug/L ND 0.60 ND 0.60 ND 0.60 ND 0.60 ND 2.0 ug/L 39 40 ND 2.0 Cobalt, dissolved ND 2.0 39 38 ug/L ND 2.0 3.5 B ug/L 17 3.6 B 4.4 B Copper, dissolved ug/L 16 ND 1.5 ND 1.5 ND 1.5 ug/L 320 18 17000 25000 Iron, dissolved ug/L 150 ND 7.0 15000 24000 ug/L 16 2.1 4.6 3.2 B Lead, dissolved 2.6 ND 0.90 L ug/L 14 0.97 I 12000 ug/L 100000 44000 9500 Magnesium, dissolved ug/L 11000 97000 42000 9100 ug/L 180 12000 11000 130 Manganese, dissolved ug/L 100 12000 11000 120 ND 0.10 ND 0.10 ug/L 0.15 ND 0.10 Mercury, dissolved ug/L ND 0.10 ND 0.10 ND 0.10 ND 0.10 ug/L 7.1 . 11 4.0 ND 2.8 Nickel, dissolved 7.3 ug/L 10 ND 2.8 11000 15000 20000 ug/L 6500 Potassium, dissolved ug/L 10000 16000 20000 6300 ug/L ND 2.0 L 8.1 L 3.3 L ND 2.0 L Sclenium, dissolved ug/L 2.2 9.5 K 2.3 ug/L ND 0.60 2.4 2.4 ND 0.60

22 B

87000 J

86000

ND 1 8

Thallium, dissolved	ug/L	.1 DN 8.1 DN	8 ND 1.8		7786 -	(1) <u>1-</u> 40 (1) (1)	ND 1.8
Vanadium	ug/L						ND 1.8
Vanadium, dissolved	ug/L	ND 1.8 ND 1.	8 ND 1,8				ND 1.8
Zine	ug/L	380 10	0 56				410
Zinc, dissolved	ug/L	420 9	7 48				41
		**************************************		***************************************	de de la del Carlo de la companyación de la company	en en en en en en en en en en en en en e	W. W. W. W. W. W. W. W. W. W. W. W. W. W
General Chemistry	•						
	Vanadium Vanadium, dissolved Zinc Zinc, dissolved	Vanadium ug/L Vanadium, dissolved ug/L Zinc ug/L Zinc, dissolved ug/L	Thallium, dissolved ug/L ND 1.8 ND 1. Vanadium ug/L 2.7 ND 1. Vanadium, dissolved ug/L ND 1.8 ND 1. Zinc ug/L 380 10 Zinc, dissolved ug/L 420 9	Thallium, dissolved ug/L ND 1.8 ND 1.8 ND 1.8 Vanadium ug/L 2.7 ND 1.8 ND 1.8 Vanadium, dissolved ug/L ND 1.8 ND 1.8 ND 1.8 Zinc ug/L 380 100 56 Zinc, dissolved ug/L 420 97 48	Thallium, dissolved ug/L ND 1.8 ND 1.8 ND 1.8 — — Vanadium ug/L 2.7 ND 1.8 ND 1.8 — — Vanadium, dissolved ug/L ND 1.8 ND 1.8 — — Zinc ug/L 380 100 56 — — Zinc, dissolved ug/L 420 97 48 — —	Thallium, dissolved ug/L ND 1.8 ND 1.8 ND 1.8 — — Vanadium ug/L 2.7 ND 1.8 ND 1.8 — — Vanadium, dissolved ug/L ND 1.8 ND 1.8 ND 1.8 — — Zinc ug/L 380 100 56 — — — Zinc, dissolved ug/L 420 97 48 — — —	Thallium, dissolved ug/L ND 1.8 ND 1.8 ND 1.8

3.1 B

230000 J

230000

ND 1.8

48000 J

46000

ND 1.8

Chloride	-	mg/L	51	560	110	 			260
Sulfate		mg/L	120	730	300	•••		-	2Š∷
Total suspended solids	e de tra contentamente en contentamente.	mg/L	4.4	ND 4	4.4	 			12
Total hardness		mg/L		**************************************	_	 <u>-</u>	<u>-</u>		

Samole Date:

Parameters

Cobalt

Copper

Iron

Lead

Magnesium

Manganese

Mercury

Potassium

Selenium

Silver, dissolved

Sodium, dissolved

Silver

Sodium

Thallium

Nickel

ug/L

ug/L

ag/L

ue/L

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 2 (a)

Date Printed: May 12, 1999 Time Printed: 2:21 pm

Sample Location:		A-18	A-20	A-23	A-24	A-25D	A-25S	A-26D	A-26OB	
Sample Date:	1	12/03/1998	12/03/1998	12/02/1998	12/02/1998	12/03/1998	12/03/1998	12/01/1998	12/01/1998	
Parameters	<u>Units</u>									
TCL Volatiles										
Chloromethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	dasarandud windhin ne ascolidi kikumhni s
Bromomethane Vinyl chloride	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Chloroethane	ug/L ug/L	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 25000 ND 10	ND 10 ND 10	3 B ND 10	KARRISAN SANIYA MUSIKU JAWA
Methylene chloride	⊥ ug/L	ND 10	ND 10	ND 10	ND 10	5 J	4 K	ND 10	ND 10 ND 10	
Acetone	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND IO	ND 10	ND 10	8 000000000000000000000000000000000000
Carbon disulfide	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	(1000000000000000000000000000000000000
1,1-Dichloroethene	vg/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	98 88 98 98 98 AV (1994)
1,1-Dichloroethane	l ug/L	ND 10	ND 10	ND 10	ND 10	В Ј	ND 10	ND 10	ND 10	schologono (puganu) paga tenggulabat N
1,2-Dichloroethene (total)	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
2-Butanone (MEK)	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	onjuner a common ar equ.
Chloroform	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	7 K	ND 10	ND 10	
1,2-Dichloroethane	\ ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
l,1,1-Trichlorgethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Carbon tetrachloride	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	erana anatona ara kasa.
Bromodichloromethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
1,2-Dichloropropane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	7050000-5070-000001000-000-10.0100
cis-1,3-Dichloropropene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Trichloroethene Benzene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	8 K	ND 10	ND 10	5000 Park 10000 P. 200 P. 201 a.v. 12
Dibromochloromethane	ug/L	ND 10	9 J	2 J	ND 10	27	55000	ND 10	ND 10	
trans-1,3-Dichloropropene	ug/L ug/L	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 25000 ND 10	ND 10 ND 10	ND 10 ND 10	1904 180 0 - 1800 - 1800 - 1800 - 1800 - 1800 - 1800 - 1800 - 1800 - 1800 - 1800 - 1800 - 1800 - 1800 - 1800 -
1,1,2-Trichloroethane	ug/L	ND 10	ND 10	ND 10	ND 10		conductive contractive contractive and an electrical de-	ND 10	~~ ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
Bromoform	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10 ND 10	ND 25000 ND 25000	ND 10	ND 10 ND 10	taratetalitareten suurgasen an enets
4-Methyl-2-pentanone (MIBK)	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 25000 ND 25000	ND 10	ND 10 ND 10	
2-Нехапопе	ug/E	ND 10	ND 10	ND 10	ND 10	ND 10 J	ND 25000	ND 10	ND 10	200,000,000,000,000,000,000,000,000
Tetrachloroethene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 25000	ND 10	ND 10	
1,1,2,2-Tetrachloroethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 25000	ND 10	ND 10	30790A2550000000000000000000000000000000000
Toluene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 25000	ND 10	ND 10	5.55.295 88 8.35.4575,35.5334
Chlorobenzene	ug/L	ND 3	130	ND 3	ND 3	210	110000	ND3	ND 3	
Ethylbenzene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 25000	ND 10	ND 10	40000000gardatersagggerggegegege
Styrene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 25000	ND 10	ND 10	
Xylenes (total)	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 25000	ND 10	ND 10	auditational pilitarianismi, idina en europiae
TCL Semi-volatiles										
Phenol	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	19 J	ND 10	ND 10	5855-0000000000000000000000000000000000
Bis(2-chloroethyl)ether	ug/L	ND 1	ND I	ND 1	ND I	ND 1	ND 5	ND I	ND I	Securitaria (San Caranta San Caranta San Caranta San Caranta San Caranta San Caranta San Caranta San Caranta S
2-Chlorophenol	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	าร์การ์การ์การ์การ์การ์การ์การ์การ์การ์ก	ND 10	ND 10	
1,3-Dichlorobenzene	ug/L	ND 10	4 J	ND 10	ND 10	170 J	540 J	ND 10	ND 10	operation (1982) The Operation (1975).

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

Page 2 (b)

Date Printed: May 12, 1999

Time Printed: 2:21 pm

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Sample Location: A-18 A-20 A-23 A-24 A-25D A-25S A-26D A-260B Sample Date: 12/03/1998 12/03/1998 12/02/1998 12/02/1998 12/03/1998 12/03/1998 12/01/1998 12/01/1998 **Parameters** Units TCL Semi-volatiles (Cont'd) 1.4-Dichlorobenzene ug/L ND 10 42 ND 10 ND 10 2500 9900 ND 10 ND 10 1.2-Dichlorobenzene ug/L ND 10 2000 36 ND 10 ND 10 6500 ND 10 **ND 10** 2-Methylphenol ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 50 ug/L ND 10 2,2'-Oxybis(1-chloropropane) ND 10 ND 10 ND 10 ug/L ND 10 ND 10 ND 50 ND 10 **ND 10** 4-Methylphenol ug/L ND 10 ND 10 ND 10 ND 10 ND 50 ND 10 ND 10 ND 10 N-nitroso-di-n-propylamine ND 10 ug/L ND 10 **ND 10** ND 10 ND 10 ND 50 ND 10 **ND 10** Hexachloroethane ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 50 ND 10 ND 10 Nitrobenzene ND 10 ND 10 ug/L ND 10 ND 10 ND 10 ND 50 ND 10 ND 10 Isophorone ND 10 ND 10 ND 10 ND 10 ND 10 ND 50 ug/L ND 10 ND 10 2-Nitrophenol ND 10 ND 10 ND 10 ug/L **ND 10** ND 10 ND 50 ND 10 ND 10 2.4-Dimethylphenol ug/L ND IO ND 10 ND 10 ND 10 ND 10 ND 50 ND 10 ND:10 Bis(2-chloroethoxy)methane ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 50 ND 10 ND 10 2.4-Dichlorophenol ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 50 ND 10 ND 10 1.2.4-Trichlorobenzene ND 10 ND 10 ND 10 ug/L 22 150 J 130 ND 10 ND 10 Naphthalene ug/L ND 10 ND 10 ND 10 ND 10 ND IO ND 50 ND 10 ND 10 4-Chloroaniline ug/L ND 10 ND 10 ND 10 ND 50 ND 10 ND 10 ND 10 ND 10 Hexachlorobutadiene: ug/L ND 10 ND 10 ND 10 ND 50 ND 10 ND 10 ND 10 ND 10 4-Chloro-3-methylphenol ug/L ND 10 ND 10 **ND 10** ND 10 ND 10 ND 50 ND 10 ND 10 2-Methylnaphthalene ND 50 ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 Hexachlorocyclopentadiene ug/L ND 10 ND 10 J ND 10 ND 10 ND 10 ND 50 ND 10 ND 10 2.4.6-Trichtorophenol ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 50 ND 10 ND 10 2,4,5-Trichlorophenol ND 25 ND 25 ND 25 ug/L ND 25 ND 25 ND 120 ND 25 ND 25 2-Chloronaphthalene ug/L ND 10 ND 10 ND 10: ND 10 ND 10 ND 50 ND 10 ND 10 2-Nitroaniline ND 25 ND 25 ug/L ND 25 ND 25 ND 25 ND 120 ND 25 ND 25 Dimethyl phthalate ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 50 ND 10 ND 10 Acenaphthylene ug/L ND 10 ND 10 ND 10 **ND 10** ND 50 ND 10 ND 10 ND 10 2.6-Dinitrotoluene ug/L ND 10 ND 10 ND 10 ND 10 ND 50 ND 10 ND 10 ND 10 3-Nitroaniline ND 25 ug/L ND 25 ND 25 ND 25 ND 25 ND 120 ND 25 ND 25 Acenaphthene ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 50 ND 10 ND 10 2,4-Dinitrophenol ug/L ND 25 ND 25 ND 25 ND 25 ND 25 ND 120 ND 25 ND 25 4-Nitrophenol ug/L ND 25 ND 25 ND 25 ND 25 ND 25 ND 120 ND 25 ND 25 Dibenzofuran ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 50 ND 10 ND 10 2.4-Dinitrotoluene ug/L ND 10 ND 10 ND 10 ND 10 ND 50 ND 10 ND 10 ND 10 Diethyl phthalate ug/L **ND 10** ND 10 ND 10 ND 10 ND 10 ND 50 ND 10 ND 10 Fluorene ND 10 ug/L ND 10 ND 10 ND 10 ND 10 ND 50 ND 10 ND 10 4-Chlorophenyl phenylether ND 10 **ND 10** ug/L ND 10 ND 10 ND 10 ND 50 ND 10 ND 10 4-Nitroaniline ug/L ND 25 ND 25 ND 25 ND 25 ND 25 ND 120 ND 25 ND 25 4,6-Dinitro-2-methylphenol ND 25 J ND 25 ug/L ND 25 ND 25 ND 25 ND 120 ND 25 ND 25 -N-nitrosodiphenylamine ND 10 ug/L ND 10 ND 10 ND 10 ND 10 ND 50 ND 10 ND 10 4-Bromophenyl phenylether ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 50 **ND 10 ND 10**

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION

DELAWARE CITY, DELAWARE AUGUST 1998 - APRIL 1999 Page 2 (c)
Date Printed: May 12, 1999
Time Printed: 2:21 pm

Sample Location:		A-18	A-20	A-23	A-24	A-25D	A-25S	A-26D	A-26OB
Sample Date:		12/03/1998	12/03/1998	12/02/1998	12/02/1998	12/03/1998	12/03/1998	12/01/1998	12/01/1998
Parameters	<u>Units</u>	-							
3 11 11 13 13 13 13 13 13 13 13 13 13 13	<u>una</u>								
TCL Semi-volatiles (Cont'd)									
Pentachiorophenol	ug/L	ND 25	ND 25	ND 25	ND 25	ND 25	ND 120	ND 25	ND 25
Phenanthrene Anthracene	ug/L vg/L	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10	ND 50	ND 10	. ND 10
Carbazole	ug/L	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 50 ND 50	ND 10 ND 10	ND 10 ND 10
Di-n-butyl phthalate	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 50	ND 10	ND 10
Fluoranthene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 50	ND 10	ND 10
Pyrene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 50	ND 10	ND 10
Butylbenzylphthalate Велzо(a)anthrasene	ug/L ug/L	ND 10 ND 10	ND 10	ND 10	ND 10	ND 10	ND 50	ND 10	ND 10
3,3'-Dichlorobenzidine	ug/L	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 50 ND 50	ND 10 ND 10	ND 10
Chrysene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 50	ND 10	ND 10 ND 10
Bis(2-ethylhexyl)phthalate	ug/L	ND 10	ND 10	ND 10	1 B	ND 10	ND 50	4 B	ND 10
Di-n-pctyl phthalate	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 50	ND 10	ND 10
Benzo(b)fluoranthene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 50	ND 10	ND 10
Benzo(k)fluoranthene Benzo(a)pyrene	ug/L	ND 10 ND 10	ND 10	ND 10	ND 10	ND 10	ND 50	ND 10	ND 10
Indeno(1,2,3-cd)pyrene	ug/L ug/L	ND 10 ND 1	ND 10 ND 1	ND 10 ND I	ND 10 ND 1	ND 10	ND 50	ND 10	ND 10
Dibenz(a,h)anthracene	ug/L	ND I	ND I	ND I	ND I	ND I ND I	ND 5 ND 5	ND I ND 1	ND I ND I
Benzo(g,h,i)perylene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 50	ND 10	ND 10
1,2-Diphenyl-hydrazine	ug/L	ND 1 J	ND I J	ND I	ND I	ND 1	ND 5	ND I	ND 1
Hexachlorobenzene	ug/L	ND 0.025	ND 0.025	ND 0.025 L	ND 0.025	0.058	ND 0.025	ND 0.025	ND:0.025
TAL Metals									•
Aluminum	ug/L	44 B	28 B	-		3700	100 B	23 B	550 J
Aluminum, dissolved	ug/L	ND 18	ND 18		-	26 B	ND 19	ND 5.4	ND 5.4
Antimony	ug/L	ND 3.1	ND 3.1		 	ND 2.9	ND 2.9	ND 3.1	ND 3.1
Antimony, dissolved Arsenic	ug/L ug/L	ND 2.9 ND 1.4	5,2 11 L			ND 3.0	ND 3.0	ND 3.1	ND 3.1
Arsenic, dissolved	ug/L	3.5	11 L	-	-	6.4 K 2.8 B	6.4 K 6.4 B	ND 1.4 L	ND 1.4 L
Barium	ug/L	19	380			37	24	4.6 B 14	ND 1.4 170
Barium, dissolved	ug/L	19	370	- -		27	$\bar{24}$	i 5	160
Beryllium	ug/L	0.27 B	ND 0.20			ND 0.20	ND 0.20	ND 0.20	ND 0.20
Beryllium, dissolved	vg/L	ND 0.20	ND 0.20	-	-	ND 0.21	ND 0.21	0.23	ND 0:20
Cadmium Cadmium, dissolved	ug/L	ND 0.30	ND 0.30		 	3.2	ND 0.20	0.69 B	ND 0.30
Calcium	ug/L ug/L	0.42 110000	ND 0.20 40000	-		3,3 130000 J	ND 0.21	0,49	ND 0.30
Calcium, dissolved	ug/L	110000	41000		<u></u>	130000 3	41000 J 41000 J	140000 140000	150000 140000
Chromium	ug/L	1.2	ND 0.60		~~ 100 200 000 Tillion. —	120	2.0	ND 0.60	1.7
	_								*11

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 2 (d)

Date Printed: May 12, 1999

Sample Location: Sample Date:	<u> </u> 	A-18 12/03/1998	A-20 12/03/1998	A-23 12/02/1998	A-24 12/02/1998	A-25D 12/03/1998	A-25S 12/03/1998	A-26D 12/01/1998	A-26OB 12/01/1998	
<u>Parameters</u>	<u>Units</u>		•							
TAL Metals (Cont'd)										
Chromium, dissolved	ug/L	1:5	ND 0.70	-	-	6.9	1.4 B	ND 0.60	ND 0.60	
Cobalt Cobalt, dissolved	ug/L ug/L	ND 2.0 ND 1.9	ND 2.0 ND 1.9		 	1100 1100	14 13	10 11	6.4 4.5	
Copper Copper, dissolved	ug/L ug/L	ND 1.5 ND 1.0	ND 1.5 ND 1.0			4.8 ND 1.0	ND 1.0 ND 1.0	2.6 B ND 1.5	5.8 B ND 1.5	
Iron Iron, dissolved	ug/L ug/L	70 21	75000 65000	 	 	7300 1900 J	12000 12000 1	22. B 9.4 B	55000 48000	
Lead Lead, dissolved	ug/L ug/L	1.1 1.0 K	4.2 ND 1.0		 	8.4 7.2	2.4 K 1.8 B	ND 0.90 ND 0.90 L	14 B 1.6 L	
Magnesium Magnesium, dissolved	ug/L ug/L	88000 94000	14000 14000	 	 	120000 J 120000 J	24000 J 24000 J	81000 86000	56000 52000	
Manganese Manganese, dissolved	ug/L ug/L	97 96	550 540	-		69000 J 70000 J	8800 J 8700 J	1100 1100	9400 8800	
Mercury Mercury, dissolved	ug/L ug/L	0.37 0.12	ND 0.10 0.14	 	 	19 7.7 L	1,4 0,18 L	0.35 0.10	ND 0.10 ND 0.10	
Nickel Nickel dissolved	ug/L ug/L	9.9 12	ND 2.8 ND 1.5	 	-	240 150	2,5 ND 1,5	16 17	ND 2.8 ND 2.8	
Potassium Potassium, dissolved	ug/L ug/L	25000 25000	4300 4600	 	 	36000 39000	40000 42000	28000 29000	110000 100000	
Selenium Selenium, dissolved	ug/L ug/L	9.4 B 5.7	2.3 B ND 2.4	- -	 	24 24	ND 2.4 3.9	ND 2.0 L 4.6	2.2 L 3.3 K	
Silver Silver, dissolved	ug/L ug/L	ND 0.60 ND 0.60	4.2 ND 0.60	_ 	 	ND 0.60 ND 0.61	ND 0.60 ND 0.61	ND 0.60 1,2 B	1.1 1.9 B	
Sodium Sodium, dissolved	ug/L ug/L	440000 4400 00	21000 22000			480000 590000	500000 590000	650000 J 730000	220000 J 200000	
Thallium Thallium, dissolved	ug/L ug/L	ND 1.8 3.0 B	ND 1.8 4.2	 	-	77 76	14 B 13 B	2.9 B ND 1.8	ND 1.8 ND 1.8	
Vanadium Vanadium, dissolved	ug/L ug/L	ND 1.8 ND 2.1	ND 1.8 ND 2.1	-		7.6 ND 2.1	ND 2.1 ND 2.1	ND 1.8 ND 1.8	ND 1.8 ND 1.8	
Zinc; dissolved	ug/L ug/L	78 85	19 B 13			48 B 37 B	5.0 B 5.7 B	66 B 67	130 120	
General Chemistry										
Chloride	mg/L	1200	150			430	910	1200	450	adagāg spice, pa, ac va drandanas an k +-
Sulfate Total suspended solids	mg/L mg/L	470 ND 4	ND 1.0 7.6			1700 50	320 12	830 4	220 61	
Total hardness	mg/L	-	-		 	.	-			

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

Page 3 (a)

Date Printed: May 12, 1999

Time Printed: 2:21 pm

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Sample Location: Sample Date:		A-26S 12/01/1998	A-27D 12/03/1998	A-27S 12/03/1998	A-29D 12/02/1998	A-29OB _12/02/1998	A-29S 12/02/1998	A-29S 12/02/1998	A-30D 12/03/1998	
<u>Parameters</u>	<u>Units</u>							Dupl,		
TCL Volatiles										
Chloromethane Bromomethane Vinyl chloride Chloroethane Methylene chloride Acetone Carbon disulfide i,1-Dichloroethene 1,2-Dichloroethene (total) 2-Butanone (MEK) Chloroform 1,2-Dichloroethane 1,1,1-Trichloroethane Carbon tetrachloride Bromodichloromethane 1,2-Dichloroethane 1,2-Dichloroethane Carbon tetrachloride Bromodichloromethane 1,2-Dichloropropane cis-1,3-Dichloropropene Trichloroethene Benzene Dibromochloromethane trans-1,3-Dichloropropene 1,1,2-Trichloroethane Bromoform	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	ND 10 NP 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10 ND 10 ND 10 ND 10 2 B ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	
4-Methyl-2-pentanone (MIBK) 2-Hexanone Tetrachloroethene 1,1,2;2-Tetrachloroethane Toluene Chlorobenzene Ethylbenzene Styrene Xylenes (total) TCL Semi-volatiles Phenol Bis(2-chloroethyl)ether 2-Chlorophenol 1,3-Dichlorobenzene	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 1 ND 1 ND 1	ND 10 ND 10 20 ND 10	ND 10 ND 10 3 J ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 1 ND 1 ND 1 ND 1	ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 1 ND 1 ND 1	ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10	ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 1 ND 1 ND 1 ND 1 ND 1	ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10	ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10	

9U:\DBASEGRP\CHEM\7000\7462\5c) Anal - GW - Target Analyses

05/10/99

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 3 (b)

Date Printed: May 12, 1999

Sample Location:		A-26S	A-27D	A-27S	A-29D	A-29OB	A-29\$	A-29S	A-30D	
Sample Date:		12/01/1998	12/03/1998	12/03/1998	12/02/1998	12/02/1998	12/02/1998	12/02/1998	12/03/1998	
		·						Dupl.	-	
Parameters	<u>Units</u>							-	-	
TCL Semi-volatiles (Cont'd)										
	<u></u>				ania tata ang ang mang manana	Material Property State Control			000000000000000000000000000000000000000	adalese evennon monto
1,4-Dichlorobenzene 1,2-Dichlorobenzene	ug/L	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	24000000000000000000000000000000000000
2-Methylphenol	ug/L ug/L	ND 10 ND 10	ND 10	2 B ND 10	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	*0100011000100000000000000000000000000
2,2'-Oxybis(1-chloropropane)	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10	ND 10 ND 10	ARTHUR COLUMN STREET
4-Methylphenol	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	KOMO 28000 KECKO 1950 J
N-nitroso-di-n-propylamine	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	800 800 800 000 1 100 ·
Hexachloroethane	ug/L	ND 10	ND 10	ND 10	ND IO	ND 10	ND 10	ND 10	ND 10	XXXXX (XXXXXXX, 4990)
Nitrobenzene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	\$10000 0000 BES N. BURGONS.
Isophorane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10		
2-Nitrophenol	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	PRUMPHO # 17.1004/21.17.1004/5
2,4-Dimethylphenol	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Bis(2-chloroethoxy)methane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	encontraction contract
2,4-Dichlorophenal	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
1,2,4-Trichlorobenzene	ug/L	ND 10	ND 10	1 J	ND 10	ND 10	ND 10	ND 10	ND 10	
Naphthalene	ug/L	ND 10	ND 10	ND 10	ND IO	ND 10	ND 10	ND 10	ND 10	
4-Chloroaniline	ug/L	ND 10	ND 10	ND 10	ND IO	ND 10	ND 10	ND 10	ND 10	
Hexachlorobutadiene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
4-Chloro-3-methylphenol	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
2-Methylnaphthalene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Hexachlorocyclopentadiene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	COS CONTRACTOR AND AND
2.4.6-Trichlorophenol	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
2,4,5-Trichlorophenol	ug/L	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	·
2-Chloronaphthalene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
2-Nitroaniline	ug/L	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	connections and operations of
Dimethyl phthalate	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Acenaphthylene 2,6-Dinitrotoluene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	tato anti-arron en anci-
3-Nitroaniline	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Acenaphthene	ug/L	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	Asconencias concessor esta
2,4-Dinitrophenol	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10		
4-Nitrophenol	ug/L	ND 25 ND 25	ND 25 ND 25	ND 25 ND 25	ND 25 ND 25	ND 25	ND 25	ND 25	ND 25	05000-0000-000000000000000000000000000
Dibenzofuran	ug/L ug/L	ND 25 ND 10	ND 10	ND 25 ND 10		ND 25	ND 25	ND 25	ND 25	
2,4-Dmitrotoluene	ug/L	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10	ND 10	ND 10	ND 10	200000.000.0000000000000000
Diethyl phthalate	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10	100000000000000000000000000000000000000
Fluorene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	and the state of t
4-Chlorophenyl phenylether	ug/L	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10	ND 10	20/00/00/00/09/20
4-Nitroantline	ug/L	ND 25	ND 10 ND 25	ND 25	ND 10 ND 25	ND 25	ND 25	ND 10 ND 25	ND 10 ND 25	Alice All arterior and a second
4,6-Dinitro-2-methylphenol	ug/L	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ATURKA GRESSESSESSESSES
N-nitrosodiphenylamine	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	(2000)
4-Bromophenyl phenylether	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10 ND 10	
·	~5		112 10	112 10	WIN IO	1412 10	ND IO	וו עוו	ND IO	

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 3 (c)

Date Printed: May 12, 1999

Time Printed: 2:21 pm

Sample Location: Sample Date:		A-26S 12/01/1998	A-27D 12/03/1998	A-27S 12/03/1998	A-29D 12/02/1998	A-29OB 12/02/1998	A-29S 12/02/1998	A-29\$ 12/02/1998	A-30D 12/03/1998	
		12/01/1//	12:03:1570	12.05/12/70	12/02/17/0	12/02/1990	_12/02/1998	Dupl,	12/03/1998	
<u>Parameters</u>	<u>Units</u>									
TCL Semi-volatiles (Cont'd)										
Pentachlorophenol	ug/L	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	
Phenanthrene Anthracene	ug/L ug/L	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10	ND 10	ND 10	eccentedente o donnecom :
Carbazole	ug/L	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	
Di-n-butyl phthalate	ug/L	ND to	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10		
Fluoranthene	l ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	anguniknykaota (bandbachtel)
Pyrenc	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Butylbenzylphthalate Benzo(a)anthracene	ug/L	ND 10	ND 10	ND 10	ND 10	2 B	ND 10	ND 10	ND 10	***********************
3,3'-Dichlorobenzidine	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Chrysene	ug/L ug/L	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10	ND 10	ND 10	opococonomentalistici (in pococ
Bis(2-ethylhexyl)phthalate	ug/L	ND 10	ND 10	ND 10	2 B	ND 10 2 B	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	
Di-n-octyl phthalate	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND IO	ND 10	ND 10	\$\$4\$\$\$10.00 (A4\$000)
Benzo(b)fluoranthene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	Secretaria de Calendario de Calendario de Calendario de Calendario de Calendario de Calendario de Calendario d
Benzo(k)fluoranthene	ug/L	ND 10	ND 10	ND:10	ND 10	MD 10	ND 10	ND 10	ND 10	88553.53K 977
Benzo(a)pyrene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Indeno(1,2,3-cd)pyrene	ug/L	ND I	ND 1	ND I	ND I	ND 1	ND 1	ND 1	ND I	
Dibenz(a,h)anthracene Benzo(g,h,i)perylene	ug/L	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	vod na navana navana navana na
1,2-Diphenyl-hydrazine	ug/L ug/L	ND 10 ND 1	ND 10 ND 1 J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
	ug/L	ND I	נושא	ND 1 J	ND I	ND I	ND 1	ND I	ND I I	
Hexachlorobenzene	ug/L	ND 0.025 J	ND 0.025	ND 0.025	ND 0.025	ND 0.025	ND 0.025 J	ND 0.025 L	ND 0.025	
TAL Metals									A CONTRACTOR OF THE PROPERTY O	· Acre everence consider A. A.
Aluminum	ug/L	10 B	. 53 B	200	190	250	280	320	ND 54	
Aluminum, dissolved	ug/L	ND 5.4	ND 5.4	29 B	ND 5.4	ND 5.4	ND 54	ND 54	ND 18	20808884.2808888.8
Antimony	ug/L	ND 3.1	ND 3.1	ND 3.1	ND 3.1	ND 3.1	ND 31	ND 31	ND 3.1	
Antimony, dissolved	ug/L	ND 3.1	ND 3.1	ND 2.9	ND 3.1	ND 3.1	ND 31	ND 31	13	
Arsenic	l ug/L	ND 1.4 L	ND 1.4 L	3.2 L	ND 1.4 L	ND 1.4 L	ND 14 L	ND 14 L	ND 1.4	A secure of physics of children
Arsenic, dissolved Barium	ug/L	ND 1.4	ND 1.4	7.8	ND 1.4	ND 1.4	ND 14	ND 14	4,1	
Barium, dissolved	ug/L	24	110	38	120	120	540	560	980	n nakonaneki kolimana
Beryllium	ug/L	22 ND 0.20	110	38 ND 0.20	78	110	500	500	900	
Beryllium, dissolved	ug/L ug/L	ND 0.20	ND 0,20 ND 0,20	ND 0.20 ND 0.20	ND 0.20 ND 0.20	ND 0.20 ND 0.20	ND 2.0	ND 2.0	0.32	\$360 -35 0 00 00 00 00 00 00 00 00 00 00 00 00
Cadmium	ug/L	0.53 B	0.57 B	ND 0.20 ND 0.30	ND 0.30	ND 0.20 ND 0.30	ND 2.0 ND 3.0	ND 2.0 ND 3.0	ND 0.20 ND 3.0	Sarr ZDF S
Cadmium, dissolved	ug/L	ND 0.30	ND 0.30	ND 0.20	ND 0.30	ND 0.30	ND 3.0	ND 3.0	ND 3.0 ND 0.20	(5.57x36) (887x6.324
Calcium	ug/L	46000	43000	6500	70000	180000	160000	150000	380000	660-49-4880, 4,900-00-0
Calcium, dissolved	ug/L	43000	43000	6200	65000	170000	150000	150000	370000	
Chromium	ug/L	ND 0.60	- 16	15 ·	ND 0.60	12	ND 6.0	ND 6.0	ND 0.60	T. Navadra augusta angan angan angan angan angan
	Į.									

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ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 3 (d)

Date Printed: May 12, 1999

Sample Location: Sample Date:		A-26S	A-27D	A-27S	A-29D	A-29OB	A-29S	A-29S	A-30D	
Somple Date.		12/01/1998	12/03/1998	12/03/1998	12/02/1998	12/02/1998	12/02/1998	12/02/1998	12/03/1998	
<u>Parameters</u>	<u>Units</u>							Dupl.		
TAL Metals (Cont'd)										
Chromium, dissolved	ug/L	ND 0.60	17	14	ND 0.60	2.8	18	18	ND 0.70	1861816.00000000000000000000000000000000
Cobalt Cobalt, dissolved	ug/L	9.1	ND 2.0	ND 2.0	ND 2.0	65 62	350	330	ND 2,0	980.3000080.008-009-005-0
Copper Copper	ug/L ug/L	7.7 2.0 B	ND 2.0 5.0 B	ND 1.9 ND 1.5	3.2 4.1 B	62 4,7 B	300 ND 15	320 ND 15	ND 1.9	
Copper, dissolved	ug/L	ND 1.5	1.9	ND I.0	1.6	8.3	ND IS	ND 15 ND 15	ND 1.5 7.7	(\$80000000000) \$400
Iron Iron, dissolved	ug/L	1200	110	340	17000	150000	160000	160000	360000	***************
Lead	ug/L ug/L	1100 ND 0.90	14 B ND 0.90	7.5 0.97	13000 2.6	140000	150000	150000	310000	
Lead, dissolved	ug/L	ND 0.90 L	ND 0.90 L	ND 1.0	2.6 ND 0.90 L	9.6 6.5	26 18	21 20	ND 9.0 ND 1.0	9686329990-0000
Magnesium	ug/L	51000	23000	3200	110000	140000	180000	180000	190000	
Magnesium, dissolved Manganese	ug/L	48000	24000	3300	99000	130000	160000	170000	190000	
Manganese Manganese; dissolved	ug/L ug/L	950 840	52	160 140	6.0	34000	150000	140000	2100	COSCOSION OF WALL
Mercury	ug/L	0.14	41: 24	4.5	1500 0.10	33000 0.39	140000 ND 0.10 J	140000	2000	
Mercury, dissolved	ug/L	ND 0.10	Īį	26	ND 0.10	ND 0.10	ND 0.10 J	0,88 J 1.0 J	0.47 0.54	(0000000000000000000000000000000000000
Nickel	ug/L		ND 2.8	ND 2,8	ND 2.8	25	79	ND 28	ND 2.8	SERVICE SERVICES
Nickel, dissolved Potassium	ug/L	10 22000	ND 2.8	ND 1.5	ND 2.8	13	70	58	ND 1.5	
Potassium, dissolved	ug/L ug/L	22000 21000	62000 62000	150000 150000	47000 44000	24000 22000	7400	7800	39000	SOLAKOM OMOR DIKONIMOSI
Selenium	ug/L	7.5 L	ND 2.0 L	6.4 B	ND 2.0 L	ND 2.0 L	6600 63	6800 62	35000 24	
Selenium, dissolved	ug/L	11 K	3.4	2.4	2,0	īi -	49 K	58	ND 2.4	
Silver Silver, dissolved	ug/L ug/L	ND 0.60 ND 0.60	ND 0.60	ND 0.60	ND 0.60	ND 0,60	34	35	7.1	to a service of the service of
Sodium	ug/L ug/L	330000 J	0.94 1400000 J	0,97 490000	0.64 B 510000 J	6.2 550000 J	22 510000 J	31	ND 0.60	
Sodium, dissolved	ug/L	340000	1300000	470000	530000	560000	510000	520000 J 520000	510000 480000	
Thallium	ug/L	2.4 B	2.2 B	3.2	ND 1.8	ND 1.8	ND 18	ND 18	ND 18	F-68834835,460,767
Thallium, dissolved Vanadium	ug/L	ND 1.8	ND 1.8	5.0	ND 1.8	ND 1.8	48 J	31 J	5.1	
Vanadium, dissolved	ug/L ug/L	ND 1.8 ND 1.8	ND 1.8 ND 1.8	13 12	4.0 ND 1.8	ND 1.8	ND 18	ND 18	ND 1.8	secondedMov.cv
Zinc	ug/L	39 B	45 B	35 B	39	ND 1.8 10 B	ND 18	ND 18 71	6.1 56	
Zinc, dissolved	ug/L	37	37 B	35	40	9.1 B	59 97	73	2.7 B	AT GAT AT A 1875
General Chemistry						eine e seus escriberostroscopor (1900 g. (1901 g.))	. never estat makter traveller (1996)		on needer to rest addition and de successive de successive de successive de successive de successive de succes	.00100000000000000000000000000000000000
Chloride	mg/L	660	2500	880	400	1200	2000	1000		
Sulfate	mg/L	280	2300 240	80	690 3.4	1300 280	2000 16	1800 14	2600 90	5600 S000 S000 MARK 1990 C
Total suspended solids	i mg/L	ND 4	12	ND 4	67	210	130	160	14	30000000000000000000000000000000000000
Total hardness	mg/L	_	<u>-</u>		-	30	-	· · · · · · · · · · · · · · · · · · ·		

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 4 (a)

Date Printed: May 12, 1999

Sample Location:		A-300B	A-31D	A-31OB	A-32D	A-32OB	A-32S	A-32S	A-33D	
Sample Date:		12/02/1998	12/03/1998	12/03/1998	12/03/1998	12/03/1998	12/03/1998	12/03/1998	12/03/1998	
							14/00/17/0		12/03/1996	
Daramatara	****							Dupl.		
Parameters	Units									
March 1975										
TCL Volatiles										
Chloromethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Bromomethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Vinyl chloride	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Chloroethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Methylene chloride	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	4 J	
Acetone	ug/L	ND 10	ND 10	3 J	ND 10	ND 10	ND 10	29 J	ND 10	
Carbon disulfide	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
1,1-Dichloroethene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
1,1-Dichloroethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10		
1,2-Dichloroethene (total)	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10		ND 10	
2-Butanone (MEK)	ug/L	ND 10	ND 10	ND 10	ND 10			ND 10	ND 10	
Chloroform	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	10 J	9 J	ND 10	
1,2-Dichloroethane	ug/L	ND 10	ND 10			ND 10	ND 10	ND 10	ND 10	
1,1,1-Trichloroethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Carbon tetrachloride	ug/L ug/L	ND 10		ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Bromodichloromethane	ug/L		ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
1,2-Dichloropropane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
cis-1,3-Dichloropropene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Trichloroethene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Benzene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Dibromochloromethane	ug/L	ND 10	ND 10	ND 10	ND 10	9 J	ND 10	ND 10	ND 10	
	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
trans-1,3-Dichloropropene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
1,1,2-Trichloroethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Bromoform	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
4-Methyl-2-pentanone (MIBK)	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
2-Hexanone	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10 J	
Tetrachloroethene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
1,1,2,2-Tetrachloroethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Toluene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Chlorobenzene	ug/L	ND 3	ND 3	29	ND 3	34	ND 3	ND 3	ND 3	
Ethylbenzene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Styrene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Xylenes (total)	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
TCL Semi-volatiles										
Phenol	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	10	ND 10	
Bis(2-chloroethyl)ether	ug/L	ND 1	ND 1	ND 1	ND 1	ND 10		12 ND 1	ND 10	
2-Chlorophenol	ug/L	ND 10	ND 10	ND 10	ND 10		ND 1	ND 1	ND 1	
1,3-Dichlorobenzene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
	ug/ L	110 10	ND IV	מו שא	טו עא	ND 10	ND 10	ND 10	ND 10	

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

Page 4 (b)

ND 10

ND 10

ND 10

ND 10

Date Printed: May 12, 1999

Time Printed: 2:22 nm

AUGUST 1998 - APRIL 1999

Samole Location: A-300B A-31D A-310B A-32D A-32OB A-32S A-32S A-33D Samole Date: 12/02/1998 12/03/1998 12/03/1998 12/03/1998 12/03/1998 12/03/1998 12/03/1998 12/03/1998 Dupl. **Parameters** Units TCL Semi-volatiles (Cont'd) 1.4-Dichlorobenzene ug/L ND 10 ND 10 ND 10 1 B ND 10 ND 10 ND 10 ND 10 1.2-Dichlorobenzene υg/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 2-Methylphenol ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 2,2'-Oxybis(1-chloropropane) ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 4-Methylphenol ug/L ND 10 ND 10 ND 10 ND 10 ND 10 2] 4 J ND 10 N-nitroso-di-n-propylamine ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 Hexachloroethane ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 Nitrobenzene ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 Isophorone ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 2-Nitrophenol ug/L ND 10 ND 10 ND 10 ND 10 **ND 10** ND 10 ND 10 ND 10 2,4-Dimethylphenol ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 Bis(2-chloroethoxy)methane ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 2,4-Dichlorophenol ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 1,2,4-Trichlorobenzene ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 **ND 10** ND 10 Naphthalene ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 4-Chloroaniline ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 Hexachlorobutadiene ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 4-Chloro-3-methylphenol ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 2-Methylnaphthalene ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 Hexachlorocyclopentadiene ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 2.4.6-Trichtorophenol ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 2.4.5-Trichlorophenol ug/L ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 2-Chloronaphthalene ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 2-Nitroaniline ug/L ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 Dimethyl phthalate ND 10 ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 Acenaphthylene ug/L ND 10 **ND 10 ND 10** ND 10 ND 10 **ND 10** ND 10 ND 10 2.6-Dinitrotoluene ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 3-Nitroaniline ug/L ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 Acenaphthene ue/L ND 10 ND 10 ND 10 ND 10 ND 10 ND to ND 10 ND 10 2,4-Dinitrophenol ug/L ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 **ND 25** 4-Nitrophenol ug/L ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 Dibenzofuran ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 2.4-Dinitrotoluene ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND ID ND 10 ND 10 Diethyl phthalate ND 10 ug/L **ND 10** ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 Fluorene ND 10 ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 4-Chlorophenyl phenylether ug/L ND 10 **ND 10** ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 4-Nitroaniline ug/L ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 4.6-Dinitro-2-methylphenol ug/L ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 N-nitrosodiphenylamine ug/L ND-10 ND 10 ND 10 ND 10 ND 10 ND 10

ND 10

ND 10

ND 10

ND 10

4-Bromophenyl phenylether

ND 10

ND 10

ug/L

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION

DELAWARE CITY, DELAWARE AUGUST 1998 - APRIL 1999 Date Printed: May 12, 1999 Time Printed: 2:22 pm

Page 4 (c)

Sample Location: Sample Date:		A-30OB 12/02/1998	A-31D 12/03/1998	A-31OB 12/03/1998	A-32D 12/03/1998	A-32OB 12/03/1998	A-32S 12/03/1998	A-32\$ 12/03/1998 Dupl.	A-33D _12/03/1998	
<u>Parameters</u>	<u>Units</u>							Dupi.		
TCL Semi-volatiles (Cont'd)										
Pentachlorophenol	ug/L	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	
Phenanthrene Anthracene	ug/L ug/L	ND 10 ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	Marianananananan
Carbazole	ug/L	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	
Di-n-butyl phthalate	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	\$17888686868889999
Fluoranthene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	Alla Bassasanu is ya
Pyrene Butylbenzylphthalate	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Benzo(a)anthracene	ug/L ug/L	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10	ND 10	rosa rosania (koji
3,3'-Dichlorobenzidine	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	
Chrysene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	P08/62/04/44.3
Bis(2-ethylhexyl)phthalate Di-n-octyl phthalate	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	2 B	ND 10	ND 10	c recognisande la crae, ve
Benzo(b)fluoranthene	ug/L ug/L	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Benzo(k)fluoranthene	ug/L	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	Marga robařa aktor a
Benzo(a)pyrene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	
Indeno(1,2,3-cd)pyrene	ug/L	ND I	ND 1	ND I	ND I	ND I	ND 1	ND 1	ND I	
Dibenz(a,h)anthracene Benzo(g,h,i)perylene	ug/L	ND 1	ND 1	ND I	ND 1	ND 1	ND 1	ND 1	ND 1	wat, www.comingr. you.orgo.gr
1,2-Diphenyl-hydrazine	ug/L ug/L	ND 10 ND 1	ND 10 ND 1-J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
	_	I dN	NDII	ND 1 J	ND 1 J	NDII	ND 1 J	ND 1	ו מא	•
.Hexachlorobenzene	ug/L	ND 0,025	ND 0.025	ND 0:025 L	ND 0.025 L	ND 0.025	ND 0,025 J	ND 0.025 L	ND 0.025	
TAL Metals									and the second s	ante e acerte en entitorie
Aluminum	ug/L	400	340	11000	18000	530	8900	13000	420	
Aluminum, dissolved	ug/L	27 B	19 B	9900	18 B	29 B	49 B	13000 51 B	430 20 B	\$100.000Å\$ 03568
Antimony	ug/L	ND 3.1	ND 3.1	ND 3.1	ND 3.1	ND 3.1	ND 3.1	ND 3.1	ND 2.9	
Antimony, dissolved Arsenic	ug/L	ND 2.9	ND 2.9	ND 2:9	4.1	ND 2.9	ND 2.9	3.3	ND 3.0	
Atsenic, dissolved	ug/L ug/L	9.0 L 9.3	ND 1.4 3.1	ND 1.4 L 4.4	3.6	18 L	. 10 L	9.0 L	3.8 K	SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS
Barium	ug/L	320	120	4.4 51	1.7 140	21 410	5.5 150	6.0 160	2.9 B	
Barium, dissolved	ug/L	300	110	49	62	390	140	130	31 30	Normalia
Beryllium	ug/L	0.37	ND 0.20	1.4 L	1.0 B	_ 0.34 B	0.75 В	0.70 B	ND 0.20	100000000000000000000000000000000000000
Beryllium, dissolved Cadmium	ug/L	ND 0.20	ND 0.20	1,1	ND 0.20	ND 0.20	ND 0.20	ND 0.20	ND 0,21	
Cadmium, dissolved	ug/L ug/L	ND 0.30 ND 0.20	ND 0.30	ND 0.30	ND 0.30	ND 0.30	ND 0.30	ND 0.30	0,40	ere erentaturen eta erreta eta erreta eta erreta eta erreta eta erreta eta erreta eta erreta eta erreta eta er
Calcium	ug/L ug/L	ND 0.20 63000	ND 0.20 21000	ND 0,20 58000	ND 0,20	ND 0:20	ND 0.20	ND 0.20	0.43	
Calcium, dissolved	ug/L	67000	20000	58000	56000 59000	94000 93000	55000 59000	57000 60000	85000 J 85000 J	staarinastookuuten
Chromium	ug/L	1.5	2.4	2,4	40	17	100	88	85000 J 1,2	0.4040.760-4,000.9607.
	I .									

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 4 (d)

Date Printed: May 12, 1999 Time Printed: 2:22 pm

Sample Location: Sample Date:		A-30OB 12/02/1998	A-31D 12/03/1998	A-31OB 12/03/1998	A-32D 12/03/1998	A-32OB _12/03/1998	A-32S 12/03/1998	A-32S 12/03/1998	A-33D 12/03/1998	
P								Dupl.		
<u>Parameters</u>	<u>Units</u>									
TAL Metals (Cont'd)	 									
Chromium, dissolved Cobalt	ug/L	1.4	ND 0,70	2.1	2.2	8.2	::::::::::::::::::::::::::::::::::::::	9.6	0.81 B	
Cobalt, dissolved	ug/L ug/L	5.5 5.2	ND 2.0 ND 1.9	20 21	9.6 ND 1.9	11 8.0	22 18 J	18 34 J	6.3 6.1	
Copper Copper, dissolved	ug/L	3.4 B	ND 1.5	1.1	10	9.0	15	18	ND 1.0	, na nachaeontaisean buolae suura (na) an suurakseen sa oo nachtaalaa suuraksees suuraksees sa)
Iron	ug/L ug/L	24 3500	ND 1.0 18000	3.9 70000	ND 1.0 39000	ND 1.0 42000	ND 1,0 31000	ND 1.0 29000	ND 1.0 900	
Iron, dissolved	ug/L	300	15000	67000	16000	38000	22000	22000	19 B	
Lead Lead, dissolved	ug/L ug/L	2.1 B 1.6 K	1.3 ND 1.0	8.8 6.6	7.7 ND 1.0	4.6 ND 1.0	12 ND 1.0	14 ND 1.0	1.4 K	
Magnesium	ug/L	130000	7500	91000	100000	180000	93000	93000	ND 1.0 120000 J	
Magnesium, dissolved Manganese	ug/L	150000	7400	100000	110000	190000	110000	120000	120000 J	
Manganese, dissolved	ug/L ug/L	1400 1500	260 250	6900 7100	2400 2400	1400 1400	1300 1600	1300 1600	210 J 190 J	
Mercury	ug/L	0.45	ND 0.10	ND 0.10	0.21	0.44	0.75 J	1.1 J	ND 0.10	
Mercury, dissolved Nickel	ug/L ug/L	0.44 4.3	ND 0.10 ND 2.8	0,14	ND 0.10	0.28	0.10 DM	ND 0.10	0.23 L	
Nickel, dissolved	ug/L	10	ND 1.5	19 23	19 1.8	8.6 5.6	140 J 19 J	93 J 50 J	13 12	
Potassium	ug/L	210000	22000	54000	51000	180000	100000	110000	44000	
Potassium, dissolved Selenium	ug/L ug/L	240000 6.6 B	24000 4.5 B	49000 3.0 B	51000 7.1 B	170000	98000	38000 Ž	45000	
Selenium, dissolved	ug/L	ND 2.4	ND 2.4	ND 2.4	ND 2.4	4.3 B ND 2.4	3.7 B ND 2.4	6.1 B ND 2.4	ND 2.4 ND 2.5	V\$200000 TEV-2013 V33
Silver	ug/L	1.9	ND 0.60	4.7	1.8	2.0	1.8	1.6	ND 0.60	
Silver, dissolved Sodium	ug/L ug/L	ND 0.60 3600000	ND 0.60 25000	ND 0.60 2000000	ND 0.60 210000	ND 0,60 1800000	ND 0.60 440000	ND 0.60 480000	ND 0.61 730000	
Sodium, dissolved	ug/L	3100000	29000	1900000	230000	1700000	440000	430000	770000	
Thallium Thallium, dissolved	ug/L	ND 1.8	ND 1.8	ND 1.8	ND 1.8	ND 1.8	ND 1.8	ND 1.8	7.9 B	n van de Galante - noondaar ondaavake oor op by eer. Ooksal ontstock foreide had Thatakan van de need eer.
Vanadium	ug/L ug/L	5.2 2.8	ND 1.9 3.8	14 ND 1.8	4.0 B 34	5,6 B 6,1	4,4 B 43	3.7 B 41	6.2 B ND 2.1	
Vanadium, dissolved	· ug/L	ND 2.1	ND 2.1	ND 2.1	ND 2.1	5.9	6.6	6.8	ND 2.1	
Zinc Zinc, dissolved	ug/L ug/L	660 460	42 B 24	260 250	94 25	22 B 21	99 28	110 36	64	5.657355756.4.244.6556.486.5
	• • • • • • • • • • • • • • • • • • •	700		230	47		40	30	61 B	
General Chemistry										
Chloride	mg/L	5600	59	3300	370	2900	470	600	1700	
Sulfate	mg/L	140	ND 1.0	900	5.8	39	58	60	1700 400	
Total suspended solids	mg/L	12	ND 4	10	1600	99	280	210	25	annan armadu Marada (Marada de Silvania). Annan araban armada (Albania) (Marada de Silvania).
Total hardness	mg/L									

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Date Printed: May 12, 1999

Page 5 (a)

Time Printed: 2:22 pm

Sample Location: Sample Date:		A-33S 12/03/1998	A-34D 12/02/1998	A-34S 12/02/1998	A-35D 12/02/1998	A-35S 12/02/1998	A-36D 12/03/1998	A-36S 12/03/1998	A-37D 12/04/1998	
Parameters	<u>Units</u>									
TCL Volatiles										
Chloromethane Bromomethane	ug/L ug/L	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 16	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	
Vinyl chloride	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	11 K	409 400,000,000,000,000,000,000,000,000,000
Chloroethane Methylene chloride	ug/L	ND 10	ND 10	ND 10	ND 10	ND IO	ND 10	ND 10	ND 10	
Acctone	ug/L ug/L	4 J ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	2 B	ND 10	ND 10	ND 10	muttiprocinación a consideración a la consideración a la consideración a la consideración a la consideración a
Carbon disulfide	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 J ND 10	AAA PAAR SA SA SA SA SA SA SA SA SA SA SA SA SA
1,1-Dichleroethene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	3800 1 880 32.00 (3.48 (3.40)
1,1-Dichloroethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
1,2-Dichloroethene (total)	ug/L	ND 10	ND 10	ND 10	ND 10	8 J	ND 10	ND 10	ND 10	
2-Butanone (MEK) Chloroform	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	******************
1,2-Dichloroethane	ug/L ug/L	ND 10 ND 10	7 J ND 10	9 J ND 10	ND 10 ND 10	, 9 J	ND 10	14	ND 10	
1,1,1-Trichloroethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	18 K ND 10	2000 T0000 000 De 2000 000 est 1
Carbon tetrachloride	ug/L	ND 10	70	330	ND 10	ND 10	ND 10	ND 10	ND 10	80888800000000000000000000000000000000
Bromodichloromethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	0780200 v.6008280000
1,2-Dichloropropane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	en un préder pag apparation de la catalité
cis-1;3-Dichloropropene Trichloroethene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Benzene	ug/L ug/L	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	3 J	30 J	ND 10	ND 10	ND 10	Muldoudd Mil Mil Maria a ganlawyd yr
Dibromochloromethane	ug/L	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	1100	
trans-1,3-Dichloropropene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10 ND 10	2008000000AAAA20000000000000
1,1,2-Trichloroethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	20 0000 A .
Bromoform	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	3830933702270223773
4-Methyl-2-pentanone (MIBK)	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
2-Hexanone Tetrachloroethene	ug/L	ND 10 J	ND 10	ND 10	ND 10 J	1000-1004-1000-200-20				
1.1,2,2-Tetrachloroethane	ug/L ug/L	ND 10 ND 10	10 ND 10	18	5 J	56 J	ND 10	38	ND 10	or officers and recovery and a superior service.
Toluene	ug/L	ND 10 ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10	ND 10	
Chlorobenzene	ug/L	ND 3	`````````	ND 3	ND 10	ND 3	ND 10 ND 3	ND 10 ND 3	ND 10 4300	
Ethylbenzene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	10:30:40%.000%.A7-99
Styrene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Xylenes (total)	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	meetraconie orhanancoluporitras.
TCL Semi-volatiles										
Phenol	ug/L	ND (0	ND 10	ND 10	ND 10		888.000.00 <u>0000000000000000000000000000</u>	ocenny conservation agree was	NOME HEIG BODDS OF FREE TOOK	
Bis(2-chloroethyl)ether	ug/L	ND 1	ND 10	ND 10 ND 1	ND 10	ND 10	ND 10	ND 10	32	AM 6 C28 C25 C35
2-Chlorophenol	ug/L	ND 10	ND 10	סו מא	ND 10	ND 1 ND 10	ND 1 ND 10	ND 1 ND 10	ND 1	1.0020000000000000000000000000000000000
1,3-Dichlorobenzene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10 ND 10	51 75	

17U;\DBASEGRP\CHEM\7000\7462\5c) Anal - GW - Target Analyses

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ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 5 (b)

Date Printed: May 12, 1999

Sample Location:		A-33\$	A-34D	A-34S	A-35D	A-35S	A-36D	A-36S	A-37D	
Sample Date:		12/03/1998	12/02/1998	12/02/1998	12/02/1998	12/02/1998	12/03/1998	12/03/1998	12/04/1998	
										
Parameters	<u>Units</u>									
TCL Semi-volatiles (Cont'd)										
I,4-Dichlorobenzene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	1100	Section.
1,2-Dichlorobenzene	ug/L	ND 10	3 J	ND 10	ND 10	ND 10	ND 10	ND 10	650	Targette of
2-Methylphenol	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
2,2'-Oxybis(1-chloropropane) 4-Methylphenol	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	、 ND 10	soupurtorne:
N-nitroso-di-n-propylamine	ug/L	ND 10 ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Hexachloroethane	ug/L ug/L	ND 10	ND 10 ND 10	ND 10 2-1	ND 10	ND 10	ND 10	ND 10	ND 10	0.0000
Nitrobenzene	ug/L	ND 10	ND 10 ND 10	ND 10	ND 10 ND 10	ND 10	ND 10	ND 10	ND 10	
[sophorone	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10	Sec. 25.
2-Nitrophenol	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	AZ
2,4-Dimethylphenol	ug/L	ND IO	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10 J	28.933.7
Bis(2-chloroethoxy)methane	ug/L	ND 10	ND 10	ND 10	ND 10	- ND 10	ND 10	ND 10	ND 10 ND 10	8 2KC
2,4-Dichlorophenol	ug/L	ND 10	ND 10	ND 10	ND 10	ND IO	ND 10	ND 10		80 B
1,2,4-Trichlorobenzene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	42	S. S. S. C. A.
Naphthalene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	\$ 1 °	3.32×3.4
4-Chloroaniline	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	200 S. S. S.
Hexachlorobutadiene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	100 S (50)
4-Chloro-3-methylphenol	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	10000000000000000000000000000000000000
2-Methylnaphthalene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	derenden. Souden Ver
Hexachlorocyclopentadiene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	4,7404 F. C. C. D.
2,4,6-Trichlorophenal	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
2,4,5-Trichlorophenol	ug/L	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	
2-Chloronaphthalene 2-Nitroaniline	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	3000
Dimethyl phthalate	ug/L	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	
Acenaphthylene	ug/L"	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
2.6-Dinitrotohiene	ug/L	ND 10 ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ara da se a
3-Nitroaniline	ug/L ug/L	ND 10 ND 25	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	8. N. N. S.
Acenaphthene	ug/L ug/L	ND 10	ND 25 ND 10	ND 25 ND 10	ND 25	ND 25	ND 25	ND 25	ND 25	.1466164.91
2,4-Dinitrophenol	ug/L	ND 10 ND 25	ND 10 ND 25	ND 10 ND 25	ND 10	ND 10	ND 10	ND 10	ND 10	
4-Nitrophenol	ug/L	ND 25	ND 25	ND 25 ND 25	ND 25 ND 25	ND 25	ND 25	ND 25	ND 25	provinces
Dibenzofuran	ug/L	ND 10	ND 10	ND 10	ND 10	ND 25 ND 10	ND 25 ND 10	ND 25 ND 10	ND 25	
2,4-Dinitrotoluene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10	ND 10	ND 10 ND 10	6993AWW
Diethyl phthalate	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	100 m
Fluorene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	33444
4-Chlorophenyl phenylether	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	\$ 350,000
4-Nitroaniline	ug/L	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	10.000°
4,6-Dinitro-2-methylphenol	ug/L	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	4,399,0
N-nitrosodiphenylamine	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10-1	Aline -
4-Bromophenyl phenylether	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	10.2° + 5.60

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES PHASE II - RCRA FACILITY INVESTIGATION

Page 5 (c)

7.3

18

Date Printed: May 12, 1999

Time Printed: 2:22 pm

OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

A-33S Sample Location: A-34D A-34S A-35D A-36D A-36S A-35S A-37D Sample Date: 12/03/1998 12/02/1998 12/02/1998 12/02/1998 12/02/1998 12/03/1998 12/03/1998 12/04/1998 **Parameters** Units TCL Semi-volatiles (Cont'd) Pentachlorophenol ug/L ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 ND 25 Phenanthrene ug/L ND 10 ND IO ND 10 ND 10 ND 10 ND 10 ND 10 **ND 10** ND 10 Anthracene ND 10 ND 10 ND 10 ug/L ND 10 ND 10 ND 10 ND 10 Carbazole ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 Di-n-buryl phthalate ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 Fluoranthene ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 Pyrene ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ug/L ND 10 ND 10 Butylbenzylphthalate ug/L ND 10 ND 10 ND 10 **ND 10** ND 10 ND 10 ND 10 ND 10 Benzo(a)anthracene ue/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 3,3'-Dichlorobenzidine ND 10 ug/L **ND 10** ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 Chrysene ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 Bis(2-ethylhexyl)phthalate ug/L 2 B ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 **ND 10** Di-n-octyl phthalate ND 10 ND 10 ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 Benzo(b)fluoranthene ND 10 ug/L ND 10 **ND 10 ND 10** ND 10 ND 10 ND 10 ND 10 Benzo(k)fluoranthene ue/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 Benzo(a)pyrene ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 J Indeno(1,2,3-cd)pyrene ug/L ND I ND I ND 1 ND 1 ND I ND I ND I ND I Dibenz(a.h)anthracene ug/L ND 1 ND 1 ND 1 ND 1 ND I ND 1 ND 1 ND 1 ND 10 Benzo(g,h,i)perylene ug/L ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 ND 10 1,2-Diphenyl-hydrazine ug/L ND 1 ND 1 ND 1 ND 1 ND 1 ND 1 J ND 1 J ND 1 Hexachlorobenzene ug/L ND 0.025 ND 0.025 J 0.041 J ND 0.025 ND 0.025 ND 0.025 0.56 ND 0.025 TAL Metals Aluminum ug/L ND 18 2900 J 2200 J 7300 J 480 J 990 J 1300 J 3600 Aluminum, dissolved ug/L ND 19 2300 1800 7100 210 150 830 ND 19 Antimony ug/L ND 2.9 ND 3.1 ND 3.1 ND 3.1 ND 3.1 ND 3.1 ND 3.1 ND 2.9 Antimony, dissolved ug/L ND 3.0 ND 3.1 ND 3.1 ND 3.1 3.4 ND 3.1 ND 3.1 ND 3.0 Arsenic ug/L 2.6 K 24 17 2.0 L ND 1.4 L 3.5 L ND 1.4 L 10 K Arsenic, dissolved 5.7 B 29 ug/L 19 8.1 5.8 B 2.1 2.7 2.2 Barium 300 22 ug/L 12 3.1 110 43 290 Barium, dissolved ug/L 290 4.6 8.2 1.6 120 49 290 Beryllium ug/L ND 0.20 0.21 ND 0.20 ND 0.20 1.4 ND 0.20 ND 0.20 ND 0.20 Beryllium, dissolved ND 0.21 ug/L 0.23 ND 0.20 ND 0:20 1.1 ND 0.20 ND 0.20 ND 0.21 Cadmium ug/L ND 0.20 0.43 B 0.48 B 0.30 B ND 0.30 3.7 0.45 B ND 0.20 Cadmium, dissolved ug/L ND 0.21 0.30 ND 0.30 0.71 ND 0.30 ND 0.30 D 0.30 ND 0.21 Calcium ug/L 80000 J 1300 2500 1600 47000 30000 16000 58000 J Calcium, dissolved ue/L 80000 J 1100 2400 1500 46000 38000 15000 58000 J Chromium υg/L ND 0.70 74 J 70 J 20 32 J ND 0.60

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 5 (d)

Date Printed: May 12, 1999

Sample Location:		A-33S	A-34D	A-34S	A-35D	A-35S	A-36D	A-36S	A-37D
Sample Date:		12/03/1998	12/02/1998	12/02/1998	12/02/1998	12/02/1998	12/03/1998	12/03/1998	12/04/1998
<u>Parameters</u>	Units								
TAL Metals (Cont'd)									
Chromium, dissolved	ug/L	0.85 B	67	71	21	28	ND 0.60	6.4	1.0 B
Cobalt	ug/L	9.9	2.2	ND 2.0	ND 2,0	110	2.8	ND 2.0	18
Cobalt, dissolved	ug/L	9.7	ND 2.0	ND 2.0	ND 2.0	82	2.4	ND 2.0	12
Copper Copper, dissolved	ug/L	ND 1.0	6.8 B	3.6 B	3.9 B	5.9 B	2.4 B	2.9 B	9 9
Iron	ug/L ug/L	ND 1.0 33000	4.8 580	ND 1.5 130	3.3 120	2.1 540	7.5 600	4.4 76	ND 1.0 57000
Iron, dissolved	ug/L	32000 J	13	ND 7.0	ND 7.0	82	29	79 B	51000 J
Lead	ug/L	1.5 K	3.6	ND 0.90	1,5	5.0	1.3	3.4	4,8 B
Lead, dissolved	ug/L	ND 1.0	ND 0.90 L	ND 0.90 L	ND 0.90 L	4.2 L	ND 0.90 L	ND 0.90 L	ND 1.0
Magnesium	ug/L	69000 J	43	37	110	24000	11000	7300	26000 J
Magnesium, dissolved	ug/L	69000 J	16 B	17 B	91	24000	15000	6900	25000 J
Manganese Manganese, dissolved	ug/L	3200 J 3100 J	110	17	7.0	5600	170	25	1700 J
Mercury	ug/L	ND 0.10	2.7 590	0.79 280	ND 0.60 110	4900 45	180	21	1300 J
Mercury, dissolved	ug/L ug/L	0.20 L	560	270	96	45 32	ND 0.10 ND 0.10	0.20 0.13	0.29 ND 0.10 L
Nickel	ug/L	13	4.9	ND 2.8	ND 2.8	100	ND 2.8	0.13 ND 2.8	18
Nickel, dissolved	ug/L	13	ND 2.8	ND 2.8	ND 2.8	27	3.1	ND 2.8	12 B
Potassium	ug/L	21000	390000	\$50000	240000	840000	57000	52000	8800
Potassium, dissolved	ug/L	22000	390000	480000	240000	970000	34000	48000	7700
Selenium	ug/L	4.3		16	26	ND 2.0 L		ND 2.0 L	4.0
Selenium, dissolved Silver	ug/L	4.6 ND 0.60	17	21	28	7.1	15	2.3	2.7
Silver, dissolved	ug/L ug/L	ND 0.60 ND 0.61	0.84 2.4 B	1.7 2.6 B	ND 0.60 0.68 B	0.82 , 1.8 B	ND 0.60 ND 0.60	ND 0.60.	ND 0.60
Sodium	ug/L	350000	3700000 J	4000000 J	520000 J	270000 J	190000 J	0.70 130000 J	ND 0.61 150000
Sodium, dissolved	ug/L	360000	3500000	4100000	520000	310000	180000	120000	150000
Thallium	ug/L	8.7 B	2,5 B	2.3 B	3.0 B	ND 1.8	ND 1.8	ND 1.8	7.2 K
Thallium, dissolved	ug/L	10 B	1.9	ND 1.8	ND 1.8	ND 1.8	ND 1.8	ND 1.8	5.3 B
Vanadium	ug/L	ND 2.1	170	110	27 26	ND 1.8	69	20	33
Vanadium, dissolved Zinc	ug/L	ND 2.1	170	110		ND 1.8	30	17	ND 2:1
Zinc, dissolved	ug/L ug/L	55 B 52	24 16 B	24 13 B	8.5 B	140	25 B	20 B	39 L
	ug/c	······································	10 B	13 5	21 B	190	23 B	12 B	22 B
General Chemistry									
Chloride	mg/L	870	5500	6200	450	1500	120	190	440
Sulfate Test learned delife	mg/L	270	850	920	740	74	280	33	32
Total suspended solids Total hardness	mg/L	4.8	64	28	12	36	37	18	120
	mg/L				· · · · · · · · · · · · · · · · · · ·		-	· · · · · · · · · · · · · · · · · · ·	

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 6 (a)

Date Printed: May 12, 1999 Time Printed: 2:22 pm

Sample Location: Sample Date:		A-37S 12/04/1998	A-38D 12/04/1998	A-39D 12/04/1998	A-39D 12/04/1998 Dupl.	A-39S 12/04/1998	A-6A 12/02/1998	A-7A 12/02/1998	B-5 12/01/1998	
<u>Parameters</u>	<u>Units</u>				- 					
TCL Volatiles										
Chloromethane Bromomethane	ug/L ug/L	ND 10 ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	obtation that you be the son region to liveus
Vinyl chloride	ug/L	ND 25000	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 130	ND 10	ND 10	ND 10	
Chloroethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	
Methylene chloride	ug/L	4 B	2 B	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Acetone	ug/L	9 J	ND 10	ND 10 J	ND 10 J	ND 10	ND 10	ND 10	ND 10	0.603 903 60400 6040 6040
Carbon disulfide	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	2119493193644499 4.250.0000000000000000000000000000000000
1.1-Dichloroethene	ug/L	38 J	ND 10	ND 10	ND 10	ND 10	ND.10	ND 10	ND 10	
I 1-Dichloroethane	ug/L	ND 10	ND 10	18	14	ND 10	ND 10	ND 10	ND 10	AND AND SHOULD S
1,2-Dichloroethene (total) 2-Butanone (MEK)	ug/L	. 10 J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Chloroform	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	erice and a contract of the co
1.2-Dichloroethane	ug/L		ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
1,1,1-Trichloroethane	ug/L	31 J ND 10	ND 10	ND 10	ND 10		ND 10	ND 10	ND 10	Sales reasona e a comunicación de la comunicación d
Carbon tetrachloride	ug/L ug/L	ND 10 34 J	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Bromodichloromethane	ug/L	ND 10	ND 10	טו עא ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	latinari danaina ta mana, asana, asanasa
1,2-Dichloropropane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
cis-1,3-Dichloroproperie	ug/L	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10	ND 10	ND 10	ND 10	toodrandol us vaccorlanteaene silapeten
Trichloroethene	ug/L	12 J	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10	ND IO	
Benzene	ug/L	78000	160 K	, ND 10 4 10	ND 10	430	ND 10 ND 10	ND 10	ND 10	: 216000100 0:::00011080210781010012.0h
Dibromochloromethane	ug/L	ND 25000	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	
.trans-1,3-Dichtoropropene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	01 UN	anteanaeach ar san comú.
1,1,2-Trichloroethane	ug/L	ND 25000	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Bromoform	ug/L	ND 25000	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
4-Methyl-2-pentanone (MIBK)	ug/L	ND 25000	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	AMERICAN CONTRACTOR AND A SECOND SECO
2-Нехапопе	ug/L	ND 25000	ND 10 J	ND 10 J	ND 10 J	ND 10	ND 10	ND 10	ND 10	
Tetrachloroethene	ug/L	ND 25000	1 K	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	.xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
1,1,2,2-Tetrachloroethane	ug/L	ND 25000	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	of Control Control Control (Control Co
Toluene	ug/L	ND 25000	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	Anti-state was a service about odder tendom udd
Chlorobenzene Ethylbenzene	ug/L	280000	840 K	160 J	98 J	510	ND 3	ND3	ND 3	20000000000000000000000000000000000000
Styrene Styrene	ug/L	ND 25000	ND 10	ND 10	ND 10	ND 10	" ND 10	ND 10	ND 10	- Anny and and and an angel
Xylenes (total)	ug/L	ND 25000	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Aylones (total)	ug/L	ND 25000	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
TCL Semi-volatiles										
Phenoi	ug/L	ND 500	ND 10	New +A					tana manasang jeunah dan saman m	6.000000000000000000000000000000
Bis(2-chloroethyl)ether	ug/L ug/L	ND 500	ND I	ND 10	ND 10	5)	ND 10	ND 10	ND 10	
2-Chlorophenol	ug/L	00 GN	ND 10	ND 1 ND 10	ND 1	ND 1	ND 1	ND I	ND 1	ณีวัสสาของสาของสาของสาของ (ค.ศ. พ.ศ. พ.ศ. พ.ศ. พ.ศ. พ.ศ. พ.ศ. พ.ศ.
1,3-Dichlorobenzene	ug/L	820	8 J	9 J ND 10	ND 10 6 J	3 J 7 J	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 6 (b)

Date Printed: May 12, 1999

Sample Location:		A-37S	A-38D	A-39D	A-39D	A-39S	A-6A	A-7A	B-5	
Sample Date:		12/04/1998	12/04/1998	12/04/1998	12/04/1998	12/04/1998	12/02/1998	12/02/1998	12/01/1998	
					Dupl.					
Parameters	Units									
										
TCL Semi-volatiles (Cont'd)							•			
1,4-Dichlorobenzene	ug/L	15000	27	62	70	44	ND 10	ND 10	ND 10	
1,2-Dichlorobenzene	ug/L	9400	ND 10	44	52	13 B	ND 10	ND 10	ND 10	XXXXX XXXX XXX XXX XXX XXX
2-Methylphenol	ug/L	ND 500	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
2,2'-Oxybis(1-chloropropane)	ug/L	ND 500	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	404004010000000000000000000000000000000
4-Methylphenol	ug/L	ND 500	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
N-nitroso-di-n-propylamine	ug/L	ND 500	ND 10	ND 10	ND 10	ND IO	ND 10	ND 10	ND 10	
Hexachloroethane	ug/L	ND 500	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Nitrobenzene	ug/L	ND 500	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Isophorone	ug/L	ND 500	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
2-Nitrophenol	ug/L	ND 500	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
2,4-Dimethylphenol	ug/L	ND 500 J	ND 10 J	ND 10 J	ND 10	ND 10 J	ND 10	ND 10	ND 10	
Bis(2-chloroethoxy)methane	ug/L	ND 500	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	CANADA CARA ARANKA ARANKA ARANGA ARAN
2,4-Dichforophenal	ug/L	ND 500	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
1,2,4-Trichlorobenzene	ug/L	130 J		8 J	9 J	ND 10	ND 10	ND 10	ND 10	
Naphthalene	ug/L	ND 500	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
4-Chloroaniline Hexachlorobutadiene	ug/L	ND 500	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ANNONE AND THE CONTROL OF THE ANNOUNCE OF
	ug/L	ND 500	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
4-Chloro-3-methylphenol 2-Methylnaphthalene	ug/L	ND 500	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Hexachlorocyclopentadiene	ug/L	ND 500	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
2,4,6-Trichlorophengl	ug/L ug/L	ND 500 ND 500	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	24/000000000000000000000000000000000000
2,4,5-Trichlorophenol		ND 1200	ND 25	ND 10 ND 25		ND 10	ND 10	ND 10	ND 10	
2-Chloronaphihalene	ug/L ug/L	ND 500	ND 10	ND 10	ND 25 ND 10	ND 25 ND 10	ND 25	ND 25	ND 25	AC 300 300 1000 - CC 1000 GRADO C 2000 C 2000
2-Nitroaniline	ug/L	ND 1200	ND 25	ND 10 ND 25	ND 10 ND 25	ND 10 ND 25	ND 10	ND 10	ND 10	
Dimethyt phthalate	ug/L	ND 500	ND 10	ND 10	ND 10	ND 10	ND 25 ND 10	ND 25 ND 10	ND 25	sa siji sa sa sa sa sa sa sa sa sa sa sa sa sa
Acenaphthylene	ug/L	ND 500	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10 ND 10	
2.6-Dinitrotoluene	ug/L	ND 500	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	estra estrución de la company.
3-Nitroaniline	ug/L	ND 1200	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 10 ND 25	
Acenaphthene	ug/L	ND 500	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	esterribei zuwarumumu, a
2,4-Dinitrophenol	ug/L	ND 1200	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	
4-Nitrophenol	ug/L	ND 1200	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	68584008040801555000000000000000000000000
Dibenzofuran	ug/L	ND 500	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
2.4-Dinitrotoluene	ug/L	ND 500	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	\$100 x 200 x 200 x 200 x 200 x 200 x 200 x 200 x 200 x 200 x 200 x 200 x 200 x 200 x 200 x 200 x 200 x 200 x 2
Diethyl phthalate	ug/L	ND 500	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Fluorene	ug/L	WD-500	ND 10	ND 10	ND 10	ND 10	ND 10	ND IO	ND IQ	200000000000000000000000000000000000000
4-Chlorophenyl phenylether	ug/L	ND 500	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
4-Nitroaniline	ug/L	ND 1200	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	
4,6-Dinitro-2-methylphenol	ug/L	ND 1200	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	201-2010/00/00/00/00/00/00/00/00/00/00/00/00/
N-mtrosodiphenylamine	ug/L	ND 500 J	ND 10-1	ND 10 J	ND IO	ND 10 J	ND 10	ND 10	ND 10	
4-Bromophenyl phenylether	ug/L	ND 500	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	x0:20x0:0000000000000000000000000000000
								- · - · - ·		

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Date Printed: May 12, 1999

Page 6 (c)

Sample Location: Sample Date:		A-37S 12/04/1998	A-38D 12/04/1998	A-39D 12/04/1998	A-39D 12/04/1998	A-39S 12/04/1998	A-6A 12/02/1998	A-7A 12/02/1998	B-5 12/01/1998	
,					Dupl.					
Parameters	<u>Units</u>									
TCL Semi-volatiles (Cont'd)										
Pentachlorophenol	ug/L	ND 1200	ND 25	ND 25	ND 25					
Phenanthrene Anthracene	ug/L ug/L	ND 500 ND 500	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	
Carbazole	ug/L	ND 500	ND 10	ND 10	ND 10	Abdaria terapangan dan dan dan				
Di-n-butyl phthalate	ug/L	ND 500	ND 10*	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Fluoranthene Pyrene	ug/L ug/L	ND 500 ND 500	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	
Butylbenzylphthalate	ug/L ug/L	ND 500	ND 10	ND 10	ND 10 ND 10					
Benzo(a)anthracene	ug/L	ND 500	ND 10	ND 10	ND 10					
3,3'-Dichlorobenzidine	ug/L	ND 500	ND 10	ND 10	ND 10	dáma casaso, ou valuados a cila e v				
Chrysene Bis(2-ethylhexyl)phthalate	ng/L ug/L	ND 500 ND 500	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 1 B	ND 10 ND 10	ND 10 ND 10	ND 10 1 B	
Di-n-octyl phthalate	ug/L	ND 500	Ř	OI DN	ND 10	ND 10	ND 10	ND 10	ี้ 0๋เ ตห	
Benzo(b)fluoranthene	ug/L	ND 500	R	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Benzo(k)fluoranthene Benzo(a)pyrene	ug/L	ND 500 ND 500 J	R	ND 10 ND 10 J	ND 10	ND 10	ND 10	ND 10	ND 10	
Indeno(1,2,3-cd)pyrene	ug/L ug/L	ND 50	R R	ND 1	ND 10 J ND 1	ND 10 J ND 1	ND 10 ND 1	ND 10 ND 1	ND 10 ND 1	
Dibenz(a,h)anthracene	ug/L	ND 50	R	ND 1	ND 1	ND 1	ND I	ND 1	ND 1	
Benzo(g,h,i)perylene	ug/L	ND 500	R	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
1,2-Diphenyl-hydrazine	ug/L	ND 50	ND 1	ND 1	ND 1	ND I	ND 1	ND I	ND 1	
Hexachlorobenzene	ug/L	ND 0.025 J	ND 0,025	0.025	ND 0:025	ND 0,025	ND 0.025	ND 0,025	ND 0.025 L	
TAL Metals									contract contract of the contr	and the second control of the second control
	į I									
Aluminum Aluminum, dissolved	ug/L	430 200 B	18 B 30 B	330 B	380 B	59 B	ronanciosian isaki sancam torkas	unnius (cost.conoccusoccenn)	22 B	ontholy rough personal constraints again
Antimony	ug/L ug/L	200 B ND 2.9	30-В ND 2.9	38 B ND 2.9	44 B ND 2.9	ND 19 ND 2.9			ND 5.4 ND 3.1	
Antimony, dissolved	ug/L	ND 3.0	ND 3.0	ND 3.0	ND 3.0	ND 3.0			ND 3.1	1983
Arsenic	ug/L	6.1 K	4.4 K	4.3 K	5.4 K	2.8 K			ND 1.4	
Arsenic, dissolved Barium	ug/L	6.6 B 29	4.7 B	6.2 B	3.6 B	2,0 B	•		ND 1,4	
Barium, dissolved	ug/L ug/L	29 28	. 71 72	24 23	24 24	25 24		oceanie de la Tarre	39 37	WE 90/1808/00000
Beryllium	ug/L	ND 0.20	ND 0.20	ND 0.20	ND 0.20	ND 0.20			ND 0.20	week skultenesseers to be a sid
Beryllium, dissolved	ug/L	ND 0.21	ND 0.21	ND 0.21	ND 0:21	ND 0.21			ND 0.20	
Cadmium Cadmium, dissolved	ug/L ug/L	ND 0.20 ND 0.21	ND 0.20 ND 0.21	8.2 8.2	8.2 8.6	0.23	genga garday <mark>F</mark> owica	ni en en en en en en en en en en en en en	0.87 B	200000000000000000000000000000000000000
Calcium	ug/L ug/L	37000 J	18000 J	8.2 150000 J	160000 J	ND 0:21 23000 J		0.000000000000000000000000000000000000	0.50 37000	
Calcium, dissolved	ug/L	36000 J	19000 1	150000 J	160000 J	23000 J	no ma dinamana Managara		36000	
Chromium	ug/L	0.97 B	ND 0.70	30	32	1.6 B	==	****	ND 0.60	

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 6 (d)

Date Printed: May 12, 1999

Sample Location:	<u> </u> !	A-37S	A-38D	A-39D	A-39D	A-39S	A-6A	A-7A	B-5	
Sample Date:		12/04/1998	12/04/1998	12/04/1998	12/04/1998	12/04/1998	12/02/1998	12/02/1998	12/01/1998	
		<u>-</u>			Dupl.					
Parameters	Units									
TAL Metals (Cont'd)										
Chromium, dissolved	ug/L	1,3 B	0.72 B	6.4 B	7.2 B	1.7 B			ND 0.60	
Cobalt Cobalt, dissolved	ug/L ug/L	ND 1.9 2.2	ND 1.9	690 670	690 720	7.4	n cuin-mataire		28	er er er legt stæret i livet.
Copper	ug/L ug/L	4.4	ND 1.9 ND 1.0	3,4	720 3.5	6.6 ND 1.0			26 5,3 B	
Copper, dissolved	ug/L	3.8	ND 1.0	1.2	1.6	ND 1.0			3.2 B	
Iron	ug/L	520	9100	48000	49000	590	COSTON COST COM COST COST COST		2100	
Iron, dissolved Lead	ug/L ug/L	12 B 1.5 B	9200 J 1.5 B	48000 J 8.0 B	49000 J 7.4 B	410 B	•		31 B	
Lead, dissolved	ug/L	1.3 B	ND 1.0	7.6 B	/.4 B	1.6 B ND 1.0	m_{ij}	aire a cològni	2.1 B ND 0.90 L	
Magnesium	ug/L	78000 J	5300 J	160000 J	160000 J	21000 J	3000000000 000 400 4 0 10 10 10 10 10 10 10 10 10 10 10 10 1		41000	######################################
Magnesium, dissolved Manganese	ug/L	76000 J	5600 J	160000 J	160000 J	20000 1	-	- -	39000	
Manganese dissolved	ug/L ug/L	66 J 68 J	220 J 220 J	68000 J 53000 J	67000 J 70000 J	7900 J 7500 J			5900 5800	
Mercury	ug/L	110	1.1	6.3	6.2	1.2	2000 - 20 2000 20 311 20 200 		ND 0.10	
Mercury, dissolved	ug/L	0.98 L	1,0 L	3,5 L	3.8 L	0.60 B	-		ND 0.10	
Nickel Nickel, dissolved	ug/L	4.4 B	ND 1.5	300	310	ND 1.5	2007. (2002. 00000000000000		31	and the second of the second o
Potassium	ug/L ug/L	5.1 B 180000	1.7 B 9300	280 42000	300 41000	ND 1.5 38000		erana ikana kana kana kana kana kana kana	31 19000	
Potassium, dissolved	ug/L	200000	9300	44000 44000	45000	35000 35000		 	18000	
Selenium	ug/L	ND 2.4	ND 2.4	25	25	ND 2.4	N 90.2000		ND 2.0 L	Minder Milder State (M.)
Selenium, dissolved Silver	ug/L	ND 2.5	ND 2.5	24	26	ND 2,5			ND 2.0 L	Canana -
Silver, dissolved	ug/L ug/L	ND 0.60 ND 0.61	ND 0.60 ND 0.61	ND 0.60 ND 0.61	ND 0.60 ND 0.61	ND 0,60 ND 0,61		 To factor of a location of the identity (a).	ND 0.60	KUKO, KONTOSON MIST ONG BOSON
Sodium	ug/L	1200000	11000	940000	970000	120000			2.3 B 190000 J	
Sodium, dissolved	ug/L	1500000	11000	1100000	1000000	120000			190000	
Thallium	ug/L	5.6 K	3.6 K	75	79	11 K	##		ND 1.8	and the same of the state of the same of t
Thallium, dissolved Vanadium	ug/L	4.6 B	3.3 B		79	11 B			ND 1.8	
·Vanadium, dissolved	ug/L ug/L	9.1 9.5	ND 2.1 ND 2.1	ND 2.1 ND 2.1	ND 2,1 ND 2,1	ND 2.1 ND 2.1			ND 1.8 ND 1.8	86770 - \$039700 10 w.0.8
Zinc	ug/L	73	10 B	390	410	12 B	**************************************		36 B	350,000,000,000,000,000,000
Zinc, dissolved	ug/L	73 56 B	12 B	390 J	420 J	10 B	-			
General Chemistry								inserve did 4 (1999)	**********	and the second of the second o
Comme Channally	,									•
Chloride	mg/L	1500	2.3	590	510	150			220	
Sulfate	mg/L	970	22	3100	3000	120		70.60 mg # 30	22	
Total suspended solids Total hardness	mg/L mg/L	4.8	ND 4	8.8	11	ND 4	virtuosotukta Taaraa		6 	Mig. The Constitute of the
Captus specificates	arana ang talah ang talah ang talah ang talah ang talah ang talah ang talah ang talah ang talah ang talah ang									

${\bf ANALYTICAL\ RESULTS\ SUMMARY\ -\ GROUNDWATER\ SAMPLES}$

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 7 (a)
Date Printed: May 12, 1999

Sample Location:		C-22	C-24	R-110	R-112	SB-10	SB-11	SB-12	SB-13	
Sample Date:		01/25/1999	01/26/1999	12/04/1998	12/04/1998	08/12/1998	08/13/1998	08/14/1998	08/19/1998	
Parameters	<u>Units</u>									
TCL Volatiles										
Chloromethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	andredat i visit a last area es
Bromomethane Vinyl chloride	ug/L ug/L	ND 10 ND 10	ND 10 10 K	ND 10 130	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 2 K	ND 10 6 J	
Chloroethane	ug/L	ND 10	ND io	ND 10	ND 10	ND 10	ND 10	ND (Õ 🖰	ND 10	70700004800084547004404
Methylene chloride	ug/L	ND 10	ND 10	ND 10	3 B	1 B	1 B	ND 10	3 B	-debute and refreshing demonstration of the
Acetone	ug/L	ND 10	ND 10	6 J	ND 10 J	6 B	2 B	2 K	150 J	
Carbon disulfide	j ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	Security Conservation for the state of the con-
1,1-Dichloroethene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
1,1-Dichloroethane 1,2-Dichloroethene (total)	ug/L ug/L	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10 ' ND 10	ND 10	ND 10	ND 10	ND 10	80° - 300 A 400 000 000 000 000 000 000
2-Butanone (MEK)	ug/L ug/L	ND 10 J	ND 10	ND 10 8 J	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	1 J 41 J	
Chloroform	ug/L	ND 10	01 DN	20	ND 10		4.1			CONTRACTOR CONTRACTOR CONTRACTOR
1,2-Dichloroethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	\$1804 St. 12 (1807 CO.)
1,1,1-Trichloroethane	∞ ug/L	ND 10	ND IO	ND 10	ND 10	ND 10	ND 10	ND IO	ND io	
Carbon tetrachloride	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	1 J	ND 10	ND 10	Control of Solds for high production (%)
Bromodichloromethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	3460 7500 (417)
1,2-Dichloropropane	i ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	· Maria Mari
cis-1,3-Dichloropropene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Trichloroethene Benzene	ug/L ug/L	ND 10	ND 10	ND 10	ND 10	2 J	ND 10	ND 10	2 J	and the state of t
Dibromochloromethane	ug/L ug/L	82 ND 10	310 K ND 10	96 ND 10	1 J ND 10	ND 10 ND 10	ND 10 ND 10	1700 ND 10	81000 ND 10 J	79.000000000000000000000000000000000000
trans-1,3-Dichloropropene	ug/L	ND 10	ND 10	ND IO	ND 10	ND 10	ND 10	ND 10	ND 10 J	200000000000000000000000000000000000000
1,1,2-Trichloroethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10 J	ABBBBBBBBBBBBBBBBBB
Bromoform	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND IO	ND 10 J	MMXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
4-Methyl-2-pentanone (MIBK)	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	24 J	wasansawayayayayaa
2-Hexanone	ug/L	ND 10 J	ND 10	ND 10 J	ND 10 J	ND 10	ND 10	ND 10	ND 10 J	
Tetrachloroethene	ug/L	ND 10	ND 10	2 J	ND 10	1 J	1 J	ND 10	5 B	
1,1,2,2-Tetrachloroethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10 J	
Toluene	ug/L	ND 10	ND 10	2 J	ND 10	ND 10	ND 10	1 K	71 J	velocity accusado aconoceous en
Chlorobenzene Ethylbenzene	ug/L ug/L	480 ND 10	1300 K	180	ND 3	, ND 3	ND 3	5700	81000	
Styrene	ug/L	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 J ND 10 J	180000000000000000000000000000000000000
Xylenes (total)	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10 J	
	-3			112 10	112 10	112 10	110 10	110 10	110 10 1	
TCL Semi-volatiles										
2 <u>1</u> 00.0000000000000000000000000000000000		bassassanaharraga <u>ar</u> raapagkassassassa	000000000000000000000000000000000000000	taat taataa saa watabu aa ee soo soo soo s	02.50000.000000000000000000000000000000	essessessessessessessessessessessessess	tarius, modesamenin esperimentamen		un mari an adramanan, in anas	e angula mada dan kabup kegangi galamanan
Phenol	ug/L	ND 10	ND 10	1J	ND 10	ND 10	ND 10	· · · · · <u>· ·</u> 74 · · ·	770 J	
Bis(2-chloroethyl)ether 2-Chlorophenol	ug/L	ND I	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	LEE TYPOSOCIONIST
1,3-Dichlorobenzene	ug/L ug/L	ND 10	11 23	3 7	ND 10	ND 10	ND 10	57 200	160 J	
1,5 200000000000000	ug/L	13	23	8 J	ND 10	ND 1	15	300	170 J	

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 7 (b)

Date Printed: May 12, 1999

Sampla Location: Sampla Date:		C-22 01/25/1999	C-24 01/26/1999	R-110 12/04/1998	R-112 12/04/1998	SB-10 08/12/1998	SB-11 08/13/1998	SB-12 08/14/1998	SB-13 08/19/1998
Sempla Date.		01/23/1999	01/20/1999	12/04/1998	12/04/1998	08/12/1998	00/13/1998	00/14/1990	08/19/1998
<u>Parameters</u>	<u>Units</u>								
TCL Semi-volatiles (Cont'd)									
1,4-Dichlorobenzene	ug/L	19	150	120	ND 10	ND 10	78	4100	2800 J
1,2-Dichlorobenzene 2-Methylphenol	ug/L ug/L	42 ND 10	140 ND 10	100 NID 10	ND 10 ND 10	ND 10 ND 10	57 ND 10	3000 ND 10	3 I 600 I
2,2'-Oxybis(1-chloropropane)	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
4-Methylphenol	ug/L	ND:10	ND 10	ND 10	ND 10	ND 10	ND 10	1.7	79 J
N-nitroso-di-n-propylamine	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Hexachloroethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND:10
Nitrobenzene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	21	10 J
Isophorone 2-Nitrophenol	ug/L ug/L	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10
2,4-Dimethylphenol	ug/L ug/L	ND 10	ND 10	ND 10 J	ND 10	ND 10	ND 10	ND IO	ND 10 ND 10
Bis(2-chloroethoxy)methane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
2,4-Dichlorophenal	ug/L	1.1	ND 10	i j	ND 10	ND 10		18	îi2
1,2,4-Trichlorobenzene	ug/L	6 J	10 J	5 J	ND 10	ND 10	150	970 J	71 J
Naphthalene	ug/L	ND 10	ND 10	l J	2 J	ND 10	1 J	ND to	79 J
4-Chloroaniline	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	63	2 J
Hexachlorobutadiene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
4-Chloro-3-methylphenol	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
2-Methylnaphthalene Hexachlorocyclopentadiene	ug/L ug/L	ND 10 ND 10	8 J ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10 ND 10
2,4,6-Trichlorophenal	ug/L	ND 10	ND 10	ND 10 2 j		ND 10	ND 10	ND 10 ND 10	ND 10
2,4,5-Trichlorophenol	ug/L	ND 25	ND 25	ND 25	ND 25	ND 25	NO 10 2 J	1 J	ND 25
2-Chloronaphthalene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND IÕ	ND 10	ND 10
2-Nitroaniline	ug/L	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25
Dimethyl phthalate	ug/L	ND 10	ND 10	ND 10	ND 10	3.1	ND 10	ND 10	ND 10
Acenaphthylene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
2.6-Dinitrotoluene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
3-Nitroaniline Acenaphthene	ug/L	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25
2,4-Dinitrophenol	ug/L ug/L	ND 10 ND 25	1 J ND 25	ND 10 ND 25	ND 10 ND 25	ND 10	ND 10	ND 10	ND 10 J
4-Nitrophenol	ug/L ug/L	ND 25	ND 25	ND 25 ND 25	ND 25	ND 25 ND 25	ND 25 ND 25	ND 25 ND 25	ND 25 ND 25
Dibenzofuran	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
2,4-Dinitrotoluene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND IO	ND 10
Diethyl phthalate	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Fluorene	ug/L	ND 10	2 J	ND 10					
4-Chlorophenyl phenylether	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
4-Nitroaniline	ug/L	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25
4,6-Dinitro-2-methylphenol	ug/L	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25
N-nitrosodiphenylamine	ug/L	ND 10	ND 10	ND 10 J	ND 10 J	ND 10	ND 10	ND 10	ND 10
4-Bromophenyl phenylether	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 7 (c)

Date Printed: May 12, 1999 Time Printed; 2:22 pm

Sample Location:		C-22	C-24	R-110	R-112	SB-10	SB-11	SB-12	SB-13	
Sampla Date:		01/25/1999	01/26/1999	12/04/1998	12/04/1998	08/12/1998	08/13/1998	08/14/1998	08/19/1998	
										
Parameters .	<u>Units</u>									
TCL Semi-volatiles (Cont'd)					•					
Pentachlorophenol	l ug/L	ND 25	ND 25	2 Ј	NT AC		**********			. e
Phenanthrene	ug/L	ND 10	NU 23	ND 10	ND 25 ND 10	ND 25 ND 10	ND 25 ND 10	ND 25 ND 10	ND 25 ND 10	ů.
Anthracene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	É
Carbazole	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	e Se
Di-n-butyl phthalate Fluoranthene	ug/L ug/L	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10	ŝ
Pyrene	ug/L ug/L	ND 10	1 J	ND 10	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	è
Butylbenzylphthalate	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ź.
Benzo(a)anthracene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	à
3,3'-Dichlorobenzidine	ug/L	ND 10	ND 10	ND 10	ND 10 J	ND 10	ND 10	ND 10	R	u:
Chrysene Bis(2-ethylhexyl)phthalate	ug/L ug/L	ND 10 2 B	ND 10 15 B	ND 10 2 B	ND 10 ND 10	ND 10 2 J	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ğ.
Di-n-octyl phthalate	ug/L	พื่อเก็	01 DN	סו מא	ND 10	ั้งเฉห	ND 10	ND 10	ND 10	ó
Benzo(b)fluoranthene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Benzo(k)fluoranthene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	٠.
Benzo(a)pyrene Indeno(1,2,3-ed)pyrens	ug/L	ND 10 ND 1	ND 10	ND 10 J	ND 10 J	ND 10	ND 10	ND 10	ND 10	38
Dibenz(a,h)anthracene	ug/L ug/L	ND 1	ND I ND I	ND 1 ND 1	ND I ND I	ND 1 ND 1	ND I ND I	ND I ND I	ND I ND I	ž
Benzo(g,h,i)perylene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	Á
1,2-Diphenyl-hydrazine	ug/L	ND 1	ND 1	ND 1	ND I	ND I	ND I	ND 1	ND i	
Hexachlorobenzene	ug/L	ND 0.025	ND 0.025	ND 0.025	ND 0.025	/%/***************************	400 - 100 100000000000000000000000000000	one weeks to be a second of the contraction		×
Treasuniotopensene	ngre	ND 0.023	ND U.V.	ND 0.025	ND 0.023	, , , , , , , , , , , , , , , , , , ,	R	R	0.071 J	ŕ
TAL Metals										
Aluminum		2400 J	1600 J	1500	NP 10					
Aluminum, dissolved	ug/L ug/L	2400 J 32	38	1500 1000 B	ND 18 ND 19					3
Antimony	ug/L	ND 2.9	ND 2.9	ND 2.9	ND 2.9		**************************************			3
Antimony, dissolved	ug/L	ND 2.9	ND 2.9	ND 3.0	ND 3.0		<u>.</u> .		_	¢ ŝ
Arsenic Arsenic, dissolved	⊔ ug/L	7.5 L	7.6 L	1000	6.5	ancokaseo aero aero aero (aer		encor inconstructure		ō.
Barium	ug/L ug/L	ND 1.5 80	1.5 80	930 13	5.8 B 20	***			0.75	0
Barium, dissolved	ug/L		64	i.5 B	20 21			maarii <u>J</u> ari		ği.
Beryllium	ug/L	0.52	0.51	0.30	ND 0.20	**************************************			en hader uitger pas, one mean an los passines most propieres, with the security	>
Beryllium, dissolved	ug/L	ND 0.20	0.63	0.23	ND 0.21					å:
Cadmium Cadmium; dissolved	i ug/L ug/L	2.7 ND 0.20	2.1 0.60	ND 0.20 ND 0.21	0.53 0.71 B			marketine.		h.
Calcium	ug/L ug/L	110000	120000	22000 J	57000 J					Ä
Calcium, dissolved	ug/L	110000	130000	32000 i	58000 J			· · · · · · · · · · · · · · · · · · ·		j
Chromium	ug/L	14	10	5.2 B	ND 0.70		==	== 		
	i									

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 7 (d)

Date Printed: May 12, 1999

	SB-11 SB-12 SB-13 13/1998 08/14/1998 08/19/1998
01/25/1999 01/25/1999 12/04/1996 08/12/1998 06/	<u>13/1998</u> <u>08/14/1998</u> <u>08/19/1998</u>
<u>Parameters</u> <u>Units</u>	
TAL Metals (Cont'd)	
Chromium, dissolved ug/L 1:3 B 1:6 B 1:8 B 0.98 B	
Cobalt ug/L 15 12 ND 1,9 7.9 Cobalt_dissolved ug/L 6.8 7.5 ND 1.9 8.1	
Copper ug/L 14 8.3 23 ND 1.0 Copper, dissolved ug/L 2.2 B 2.4 B 1.2 ND 1.0	
Iron ug/L 4200 3600 700 220 B	
Iron, dissolved ug/L 380 B 340 B 270 B 360 B Lead ug/L 18 11 6.5 B 1.0 B	
Lead, dissolved ug/L ND 1.0 ND 1.0 1.1 B Magnesium ug/L 56000 59000 12000 J 45000 J	± 3 ± 3 ± 3 ± 3 ± 3 ± 3 ± 3 ± 3 ± 3 ± 3
Magnesium, dissolved ug/L 54000 62000 17000 J 44000 J	
Manganese, dissolved ug/L 6400 7200 21 B 2000 J	
Mercury ug/L 31 29 57 ND 0.10 Mercury, dissolved ug/L 0.31 0.19 2.5 L 0.37 B	
Nickel ug/L 37 35 8.8 B 20	
Potassium ug/L 99000 97000 46000 68000	
Potassium, dissolved ug/L 89000 J 93000 J 44000 74000 — Selenium ug/L ND 1.9 7.8 7.2 ND 2.4 —	
Selenium, dissolved ug/L 2.5 K 5.2 4.7 ND 2.5 -	
Silver, dissolved ug/L ND 0.60 ND 0.60 ND 0.61 ND 0.61	
Sodium ug/L 570000 570000 1900000 1300000 — Sodium; dissolved ug/L 470000 590000 2300000 1600000 —	
Thallium ug/L ND 1.2 ND 1.2 ND 19 10 K	
Vanadium. ug/L 32 23 1800 ND 2.1	
Vanadium, dissolved ug/L 5.7 3.1 1400 ND 2.1 Zinc ug/L 710 650 23 B 150	
Zinc, dissolved ug/L 300 400 5.4 B 180 B	Popularija
General Chemistry	
Chloride mg/L 2000 2200	
Sulfate mg/L — 730. 770 — Total suspended solids lmg/L 440 67 26 ND 4 —	
Total hardness mg/L 600 730	÷.

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 8 (a)
Date Printed: May 12, 1999
Time Printed: 2:22 pm

Sample Location:		SB-13	SW-1	SW-2	SW-2	SW-3	SW-4	SW-5	SW-6	
Sample Date:		08/19/1998	12/17/1998	12/17/1998	12/17/1998	12/17/1998	12/16/1998	12/16/1998	12/15/1998	
		Dupl.			Dupi.					
Parameters	Units									
<u> </u>	<u>omb</u>									
TCL Volatiles										
Chloromethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Bromomethane Vinyl chloride	ug/L	ND 10	ND 10	ND 10	01 QK	ND 10	ND 10	ND 10	ND 10	
Chloroethane	ug/L ug/L	7 J ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10	4071906.010001000.400100
Methylene chloride	ug/L	3 B	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10	6 J	ND 10 ND 10	237 800 000
Acetone	ug/L	160 J	ND 10	ND 10	ND 10	ND 10	9 1	13	ND 10	8075263047754667
Carbon disulfide	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	restation and a supply
1,1-Dichloroethene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
1,1-Dichloroethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
1,2-Dichloroethene (total)	ug/L	17	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
2-Butanone (MEK) Chloroform	ug/L	42 J 2 J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	earth at latest to the territories
1,2-Dichloroethane	ug/L ug/L	ND 10	ND 10 ND 10	2 J ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10	
1,1,1-Trichloroethane	ug/L	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10	ND 10 ND 10	884888888884 - \$10000 F
Carbon tetrachloride	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Bromodichloromethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	80000000000000000000000000000000000000
1,2-Dichloropropane	l ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	200/000054000
cis-1,3-Dichloropropene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	5.786785.897.7874
Trichloroethene	ug/L	1 J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	000000000000000000000000000000000000000
Benzene	ug/L	85000	47	48	49	43	16	13	ND 10	
Dibromochloromethane	ug/L	ND 10 J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	voluntariore anno anno anno anno
trans-1,3-Dichloropropene	ug/L	ND 10 J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	3.000000
1,1,2-Trichloroethane Bromoform	ug/L	ND 10 J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	w www.execut. we so so wow o
4-Methyl-2-pentanone (MIBK)	ug/L ug/L	ND 10 J 26 J	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	8486473 TX
2-Hexanone	ug/L	ND 10 J	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10 J	ND 10 ND 10 J	ND 10 ND 10 J	usa dago readalado esta
Tetrachloroethene	ug/L	2 B	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	9 856 200 V 0000 14
1,1,2,2-Tetrachloroethane	ug/L	ND 10 J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND IO	#5038403.0845000.60 h
Toluene	ug/L	83 J	ND 10	ND 10	ND 10	ND 10	ND 10	5 J	ND 10	**************************************
Chlorobenzene	ug/L	82000	130	130 J	130	120	42	34	ND 3	8080 NG 20050
Ethylbenzene	ug/L	ND 10 J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	A001/400 (000 (000 (000 (000 (000 (000 (000
Styrene	ug/L	ND 10 J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	\$15,000 tA804
Xylenes (total)	ug/L	ND 10 J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	**** **** *****************************
TCL Semi-volatiles										
\$2 July midulate the July national section of contests were recommended.			www.v.colou.colouseeeeee	a	24, **:					
Phenol	ug/L	150 J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Bis(2-chloroethyl)ether	ug/L	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	ND 1	was over a second
2-Chlorophenol	ug/L	60 J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
1,3-Dichlorobenzene	ug/L	79 J	ND 1	ND 1	ND 1	ND I	3	3	ND 1	

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 8 (b)

Date Printed: May 12, 1999

Sample Location:		SB-13	SW-1	SW-2	SW-2	SW-3	SW-4	SW-5	SW-6	
Sample Date:		08/19/1998	12/17/1998	12/17/1998	12/17/1998	12/17/1998	12/16/1998	12/16/1998	12/15/1998	
		Dupl.			Dupl.					
Decomposes	Units	Dup.,			Dupi.					
Parameters	<u>Units</u>									
TCL Semi-volatiles (Cont'd)										
guidenado espara e o carro por como dos como espara o desta e obresida e o deseño espara de como en contractor	i portiones es esperantes esta	8650.50; 8650000 2792227 0 Ut	>	311061606611020 <u>11</u> 101 <u>1</u> 1060000	riosstatusestaraatsvaran ota	unoficoscoccocereces (coc 2555	xel v esterator cateraria decert		toff (for these vicence of lease)	special magnetic concepts and reserved the con-
1;4Dichlorobenzene 1,2-Dichlorobenzene	ug/L ug/L	1100 J 560 J	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10		12	ND 10 ND 10	
2-Methylphenol	ug/L	300 J	ND 10	ND 10	ND 10	ND 10	10 ND 10	9 J ND 10	ND 10	0000.00 000 000000000000000000000000000
2,2'-Oxybis(1-chloropropane)	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
4-Methylphenol	ug/L	15 J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
N-nitroso-di-n-propylamine	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	par condition of a section of a section of a
Hexachloroethane	ug/L	ND 10	ND 10	ND 10 J	ND 10	ND 10	ND 10	ND 10	ND 10	
Nitrobenzene	ug/L	29 J	ND 10	ND 10	ND 10	ND 10	ND 10	2 J	ND 10	
Isophorane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
2-Nitrophenol	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	SOBVAGE TO SOLOW TO SELECTED VINADOUS AND AND AND AND AND AND AND AND AND AND
2,4-Dimethylphenol Bis(2-chloroethoxy)methane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
2,4-Dichlorophenoi	ug/L ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	C000.000000000000000000000000000000000
1.2.4-Trichlorobenzene	ug/L ug/L	8 J 240 J	ND 10 1 J	ND 10	ND 10	ND 10 ND 10	ND 10	ND 10 3 J	ND 10	
Naphthalene	ug/L	28 1	ND 10	ND 10	ָּי סוֹ מא	ND 10	4 J ND 10	ND 10	ND 10 ND 10	5858545. PUZE 4 5.000 J. SARVE (
4-Chloroaniline	ug/L	ND 10 J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Hexachlorobutadiene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	6000 900 900 900 900 900 900 900 900 900
4-Chloro-3-methylphenol	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
2-Methylnaphthalene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND IO	ND 10	ND 10°	
Hexachlorocyclopentadiene	ug/L	ND 10	ND 10	ND 10 J	ND 10	ND 10	ND 10	ND 10	ND 10	1961 (00-1170), 10010, 1001, 1-170 _{1, 1} -18
2,4,6-Trichlorophenol	ug/L	4.1	ND 10	ND 10	ND 10	ND 10	ND to	ND 10	ND 10	
2,4,5-Trichlorophenol	ug/L	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	
2-Chloronaphthalene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
2-Nitroaniline	ug/L	ND 25	ND 25	ND 25 J	ND 25	ND 25	ND 25	ND 25	ND 25	and the first of the control of the
Dimethyl phthalate	ug/L	ND 10	ИD 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Acenaphthylene 2,6-Dinitrototuene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	abacks, almonte realizació atravista, in bilant
3-Nitroaniline	ug/L ug/L	ND 10 ND 25	ND 10 ND 25	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Acenaphthene:	սց/Ը	ND 10	ND 10	ND 25 ND 10	ND 25 ND 10	ND 25 ND 10	ND 25 ND 10	ND 25 ND 10	ND 25	034039494949000000000000
2,4-Dinitrophenol	ug/L	ND 25	ND 25	ND 25	ND 10	ND 10 ND 25	ND 10 ND 25	ND 10 ND 25	ND 10 ND 25	
4-Nitrophenol	ug/L	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	78/97023887707-987038788877770
Dibenzofuran	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
2,4-Dinitrotoluene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND IO	ND 10	ND 10	
Diethyl phthalate	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	econocidados magnormos de describiros do
Fluorene	ug/L	ND 10	ND 10	ND IO	ND 10	ND 10	ND 10	ND 10	ND 10	
4-Chlorophenyl phenylether	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
4-Nitroaniline	ug/L	ND 25	ND 25	R	ND 25	ND 25	ND 25	ND 25	ND 25	
4,6-Dinitro-2-methylphenol	ug/L	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	were a service and a construction of the const
N-nitrosodiphenylamine	ug/L	ND 10	ND 10	ND 10	ND IO	ND 10	ND 10	ND 10	ND 10	
4-Bromophenyl phenylether	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES PHASE II - RCRA FACILITY INVESTIGATION

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Date Printed: May 12, 1999

Page 8 (c)

Sample Location: Sample Date:		SB-13 08/19/1998	SW-1 12/17/1998	SW-2 12/17/1998	SW-2 12/17/1998	SW-3 12/17/1998	SW-4 12/16/1998	SW-5 12/16/1998	SW-6 12/15/1998	
		Dupl.			Dupl.	12/11/12/24	_12/10/1990	12/10/1990	12.13.1990	
<u>Parameters</u>	Units									
TCL Semi-volatiles (Cont'd)										
Pentachlorophenol	ug/L	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	
Phenanthrene Anthracene	l ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	distancementarity (c), with it
Anthracene Carbazole	ug/L ug/L	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	
Di-n-butyl phthalate	ug/L	ND IO	ND 10							
Fluoranthene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	000000000000000000000000000000000000000
Pyrene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Butylbenzylphthalate	ug/L	ND 10	ND 10	ND 10	ND 10		ND 10	ND 10	ND 10	Consortato vicini a assessiva vicini
Benzo(a)anthracene 3,3'-Dichlorobenzidine	ug/L	ND 10	ND 10 ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Chrysene	ug/L ug/L	R ND 10	ND 10	R ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	Mensiiki katemana enda a
Bis(2-ethylhexyl)phthalate	ug/L	2 J	ND 10	1 J	ND 10	ND 10	ND 10	ND 10	2 J	
Di-n-octyl phthalate	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	gregor rese Negrou Pro et al el Un colo descuer las las crestas e
Benzo(b)fluoranthene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Benzo(k)fluoranthene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	
Benzo(a)pyrene Indeno(1,2,3-cd)pyrene	ug/L ug/L	ND 10 ND 1	ND 10 ND 1	ND 10 ND 1	ND 10	ND 10	ND 10	ND 10	ND 10	er alla de de reconstruir de la la destada de la companya de la companya de la companya de la companya de la c
Dibenz(a,h)anthracene	ug/L	ND I	ND I	ND 1	ND I ND I	ND 1 ND 1	ND 1 ND 1	ND 1 ND 1	ND I ND I	
Benzo(g,h,i)perylene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	8.00-01/50/1880/8888/17:
1,2-Diphenyl-hydrazine	ug/L	ND 1	ND I	ND 1	ND 1	ND I	ND 1	ND 1	ND I	\$2688.80° (181° 1965-967-97.48
Hexachlorobenzene	ug/L	18000000000000000000000000000000000000						*****************		thurusou traccinos un mini bilancino est
нехасшотовение	ug/t.	0,12 J	ND 0.025	ND 0,025	ND 0.025					
TAL Metals										
Aluminum	ug/L		1700	1900	1900	3800	1100	1700	780	
Aluminum, dissolved	ug/L	<u> </u>	ND 18	18	23					
Antimony	ug/L		ND 3.0	ornana haran al'an arawan ara						
Antimony, dissolved	ug/L		ND 2.9							
Arsenic Arsenic, dissolved	ug/L		ND 1,5	5.6 J	3.1 J	1.9	2.3	2.0	1.6	coronibreo e si unidado antanto
Barium	ug/L ug/L	apparente in capacitation of process distriction	ND 1.5 140	ND 1.5 130	ND 1.5 130	ND 1.5 140	ND 1.5 110	ND 1.5	ND 1.5	
Barium, dissolved	ug/L	 	120	110	120	110	98	110 92	58 49	F2225 F322 ST F F F F F F F F F F F F F F F F F F
Beryllium	ug/L		0.40	0.30	0.25	0.30	0.22	0.22	ND 0.21	
·Beryllium, dissolved	ug/L	-	ND 0.20	ND 0,20	ND 0.20					
Cadmium	ug/L	 	ND 0.21							
Cadmium, dissolved	ug/L		ND 0.20	ND 0.20	ND 0.20	ND 0,20	ND 0.20	ND 0.20	ND 0,20	
Calcium Calcium; dissolved	ug/L	-	19000	19000	19000	21000	20000	22000	33000	od kod Joseph vojstvelje, biologi
Chromium	ug/L ug/L		18000 2.7	19000 3.3 J	20000 2,2 J	21000 5.7	20000 ND 0.70	21000 1.8	34000 ND 0.70	
Antanian	ug' L	••	2.1	2.3 1	4.4	3,1	ND 0.70	1.6	טיים מע	

 ${\bf ANALYTICAL\ RESULTS\ SUMMARY\ -\ GROUNDWATER\ SAMPLES}$

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 8 (d)

Date Printed: May 12, 1999

Sampla Location: Sampla Date:		SB-13 08/19/1998 Dupl.	SW-1 12/17/1998	SW-2 12/17/1998	SW-2 12/17/1998	SW-3 12/17/1998	SW-4 12/16/1998	SW-5 12/16/1998	SW-6 12/15/1998	
<u>Parameters</u>	<u>Units</u>	<i>Եսի</i> լ.			Dupl.					
TAL Metals (Cont'd)										
Chromium, dissolved	ug/L		ND 0.70	ND 0,70	ND 0.70					
Cobalt Cobalt, dissolved	ug/L ug/L	 	3,3 ND 1.9	3.3 ND 1,9	3.4 ND 1.9	4.3 ND 1.9	2.4 ND 1.9	2.7 ND 1.9	ND 1.9 ND 1.9	
Copper	l ug/L		8.5	5,9	6.6	6.7	4.0	6.3	5,3	- 20 MOORE KII MARKANA OO AA WAXAA AA AA AA AA
Copper, dissolved	ug/L		ND 1.0	1.1 B	2,1 B					
Iron Iron, dissolved	ug/L ug/L		4100 28 B	4400 58 B	3700 58 B	6500 470 B	2300 22 B	3400 31 B	2400 120 B	grotegijskatigareja jesa a o c
Lead	ug/L	**************	5.8 K	4,5 K	4.7 K	5.8 K	2.5 K	3.5 K	2.9 K	
Lead, dissolved	ug/L		ND 1.0	ND 1,0						
Magnesium	ug/L	 	10000 -	11000	11000	14000	12000	14000	30000	000000000000000000000000000000000000000
Magnesium, dissolved Manganese	ug/L ug/L		10000 500	11000 650	12000 620	13000 720	11000 540	14000 620	31000 830	
Manganese, dissolved	ug/L		470	600	640	690	520	580	810	
Mercury	ug/L		0.13	0.30	0.24	0.21	0.13	0.18	0.35	in anno anno anno an anno anno anno anno
Mercury, dissolved Nickel	ug/L	-	ND 0.10	ND 0.10	ND IIO	ND 0.10	ND 0.10	01.0 GM	01.0 ДИ	
Nickel, dissolved	ug/L ug/L		5.8 2.7	5.5 2.7	5.6 2.8	7.4 2.7	3,6 2,5	4,8 2.6	4.9 3.0	
Potassium	ug/L		4500	31000	31000	40000	13000	28000	42000	espermont, chapeed sperm of per-
Potassium, dissolved	ug/L		3900	24000	31000	38000	12000	26000	42000	
Selenium Selenium, dissolved	ug/L ug/L		ND 2.5 L ND 2.4	ND 2.5 L ND 2.4	ND 2.5 L ND 2.4	ND 2.5 L	ND 2.5 L	ND 2,5 L	ND 2.5 L	660400000000000000000000000000000000000
Silver	ug/L ug/L	-	ND 0.61	ND 0.61	ND 2.4 ND 0.61	ND 2.4 ND 0.61	ND 2.4 ND 0.61	ND 2.4 ND 0.61	ND 2,4 ND 0.61	
Silver, dissolved	ug/L		ND 0.60	**************************************						
Sodíum	ug/L		28000	110000	110000	150000	63000	120000	250000	
Sodium, dissolved Thallium	ug/L		26000	88000	110000	150000	63000	120000	260000	
Thallium, dissolved	ug/L ug/L		ND 1.9 ND 1.9	ND 1.9 ND 1.9	ND 1.9 ND 1.9	ND 1.9 ND 1.9	ND 1.9 ND 1.9	ND 1.9 ND 1.9	ND 1.9 ND 1.9	
Vanadium	j ug/L		9.1	11	7.8	11	5.1	7.4	6.2	20,000,000,000,000,000,000,000
Yanadium, dissolved	ug/L	\$4.	ND 2.1							
Zinc Zinc, dissolved	ug/L ug/L		47 20 B	42	35 22 B	45	29 B	36 B	26 B	erresturación de la la comparación en el comparación de la comparación del comparación de la comparación de la comparación de la comparación de la comparación de la comparación de la comparación de la comparación de la comparación de la comparación de la comparación de la comparación de la comparación de la comparación de la comparación de la comparación de la comparación de la comparaci
Line, dissolved	ng/L		20 B	25 B	22 B	16 B	21 B	21. B	15 B	
General Chemistry										
Chloride	mg/L		••							
Sulfate	mg/L	+	<u>-</u>				<u>.</u>		·	
Total suspended solids Total hardness	mg/L		170 100	92 J 100	43 J 100	110 120	26 45	28	24	22/25/27/23/50/52/20/27/37/30/c
Anat totality	mg/L		1VV	100	1M	140	65	120	220	30/1007/00/00/00/00/00/00/00/00/00/00/00/00/

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION

Page 9 (a)

Date Printed: May 12, 1999

Time Printed: 2:22 pm

DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Sample Location: Sample Date:		SW-8 12/15/1998	SW-9	SW-10 01/26/1999	SW-11	SW-12	
29wbie nate:		12/15/1998	12/16/1998	01/26/1999	01/26/1999	01/26/1999	
Parameters	Units						
TCL Volatiles							
Chloromethane Bromomethane	ug/L ug/L	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	
Vinyl chloride	ug/L	ND 10	ND 10	170 K	6 Ј	7 J	
Chloroethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	
Methylene chloride	ug/L	4 J	ND 10	ND 10	ND 10	ND 10	
Acetone Carbon disulfide	ug/L ug/L	8 J ND 10	9.J ND 10	01 DM ND 10	ND 10 ND 10	ND 10 ND 10	
1,1-Dichloroethene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	
1,1-Dichloroethane	ue/L	ND 10	ND 10	ND 10	ND 10	ND 10	
1,2-Dichloroethene (total)	ug/L	1.1	ND 10	ND 10	ND 10	ND 10	
2-Butanone (MEK)	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	· · · · · · · · · · · · · · · · · · ·
Chloroform	ug/L	70	ND 10	ND 10	ND 10	ND 10	
1,2-Dichloroethane :1,1,1-Trichloroethane	ug/L ug/L	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	
Carbon tetrachloride	ug/L	ND 10 27	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	
Bromodichloromethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	
1,2-Dichloropropane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	
cis-1,3-Dichloropropene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	
Trichloroethene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	
Benzene	ug/L	ND 10	ND 10	900	48	52	
Dibromochloromethane trans-1,3-Dichloropropene	ug/L	2 J	ND 10	ND 10	ND 10	ND 10	
1,1,2-Trichloroethane	ug/L ug/L	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	
Bromoform	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	
4-Methyl-2-pentanone (MIBK)	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	
2-Hexanone	ug/L	ND 10 J	ND 10 J	ND 10	ND 10	ND 10	
Tetrachloroethene	ug/L		ND 10	ND 10	ND 10	ND 10	na nananananan lamanan nanan laman nanan nanan nanan nanan laman nanan nanan nanan nanan nanan nanan nanan nan
1,1,2,2-Tetrachloroethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	
Toluene Chlorobenzene	ug/L ug/L	3 J ND 3	ND 10	ND 10 4500	ND 10	ND 10 42	
Ethylbenzene	ug/L	ND 10	ND 10	4300 ND 10	43 ND 10	ND 10	
Styrene	ug/L	ND 10	ND 10	ND 10	ND 10	01 DN	
Xylenes (total)	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	
TCL Semi-volatiles							
	ug/L		ND 10	60.00000000000000000000000000000000000			
Phenol Bis(2-chloroethyl)ether		ND 10 ND 1	ND 10 ND 1	32 ND 1	ND 10 ND 1	ND 10 ND 1	
2-Chlorophenol	ug/L ug/L	ו עא ND 10	ND 10	ו עא 40	ND 10	1 UN 10 ND 10	
1,3-Dichlorobenzene	ug/L	ND 1	1 J	43	ND 10	ND 10	

33U:\DBASEGRP\CHEM\7000\7462\5c) Anal - GW - Target Analyses

05/10/99

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

Page 9 (b)

Date Printed: May 12, 1999

Time Printed: 2:22 pm

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

SW-8 Samole Location: SW-9 SW-10 SW-11 SW-12 Sample Date: 12/15/1998 12/16/1998 01/26/1999 01/26/1999 01/26/1999 Parameters Units TCL Semi-volatiles (Cont'd) 1,4-Dichlorobenzene ND 10 ug/L 6 J 710 3 1 1.2-Dichlorobenzene ug/L ND 10 ND 10 4 J 410 4 J 2-Methylphenol ND 10 ND 10 ug/L ND 10 ND 10 ND 10 2,2'-Oxybis(1-chloropropane) ug/L ND 10 ND 10 ND 10 ND 10 ND 10 4-Methylphenol ND 10 ue/L ND 10 ND 10 ND to ND 10 N-nitroso-di-n-propylamine ND 10 ND 10 ND 10 ug/L ND 10 ND 10 Hexachloroethane uø/L 7 J ND 10 ND 10 ND 10 2 1 Nitrobenzene ND 10 ND 10 ug/L ΪĴ ND 10 ND 10 Isophorone ND 10 ND 10 ND 10 ug/L ND 10 ND 10 2-Nitrophenol ND 10 ND 10 ND 10 ND 10 ND 10 ug/L 2.4-Dimethylphenol ug/L ND 10 ND 10 ND 10 ND 10 ND 10 Bis(2-chloroethoxy)methane ug/L ND 10 ND 10 ND 10 ND 10 ND 10 2,4-Dichlorophenol ND 10 ND 10 ug/L ND 10 ND 10 ND 10 1,2,4-Trichlorobenzene ug/L ND 10 ND 10 5 J ND 10 1 J Naphthalene ND 10 ug/L ND 10 9 ND 10 ND 10 4-Chloroaniline ND 10 ug/L ND 10 ND 10 ND 10 ND 10 Hexachlorobutadiene ug/L ND 10 ND 10 ND 10 ND 10 ND 10 4-Chloro-3-methylphenol ND 10 ND 10 ND 10 ug/L ND 10 ND 10 2-Methylnaphthalene ug/L ND 10 ND 10 ND 10 ND 10 ND 10 Hexachlorocyclopentadiene ug/L ND 10 ND 10 ND 10 ND 10 **ND 10** 2,4,6-Trichlorophenol ND 10 ND 10 ug/L ND 10 ND 10 ND 10 2,4,5-Trichlorophenol ND 25 ND 25 ND 25 ND 25 ug/L ND 25 2-Chloronaphthalene ug/L ND 10 ND 10 ND 10 ND 10 ND 10 2-Nitroaniline ND 25 ug/L ND 25 ND 25 ND 25 ND 25 Dimethyl phthalate ND 10 ug/L ND 10 ND 10 ND 10 ND 10 Acenaphthylene ug/L ND 10 **ND 10 ND 10** ND 10 ND 10 2,6-Dinitrotoluene ug/L ND 10 ND 10 ND 10 ND 10 ND 10 3-Nitroaniline ND 25 ug/L ND 25 ND 25 ND 25 ND 25 Acenaphthene ND 10 ND 10 ND 10 ug/L ND 10 ND 10 2,4-Dinitrophenol ug/L ND 25 ND 25 ND 25 ND 25 ND 25 4-Nitrophenol ug/L ND 25 ND 25 ND 25 ND 25 ND 25 Dibenzofuran ND 10 ND 10 ug/L **ND 10** ND 10 ND 10 2,4-Dinitrototuene ug/L ND 10 ND 10 ND 10 ND 10 ND 10 Diethyl phthalate ug/L ND 10 ND 10 **ND 10** ND 10 ND 10 Fluorene ug/L ND 10 ND 10 ND 10 ND 10 ND 10 4-Chlorophenyl phenylether ug/L ND 10 ND 10 ND 10 ND 10 ND 10 4-Nitroaniline ug/L ND 25 ND 25 ND 25 ND 25 ND 25 4,6-Dinitro-2-methylphenol ug/L ND 25 ND 25 ND 25 ND 25 ND 25 N-nitrosodiphenylamine ug/L ND 10 ND 10 ND 10 ND 10 ND 10 4-Bromophenyl phenylether ug/L ND 10 ND 10 ND 10 **ND 10** ND 10

34U:\DBASEGRP\CHEM\7000\7462\5c) Anal - GW - Target Analyses

05/10/99

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES PHASE II - RCRA FACILITY INVESTIGATION

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 9 (c)

Date Printed: May 12, 1999

Sample Location: Sample Date:		SW-8 12/15/1998	SW-9 12/16/1998	SW-10 01/26/1999	SW-11 01/26/1999	SW-12 _01/26/1999	
<u>Parameters</u>	<u>Units</u>						
TCL Semi-volatiles (Cont'd)							
Pentachlorophenol	ug/L	ND 25	ND 25	ND 25	ND 25	ND 25	
Phenanthrene Anthracene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	
Carbazole	ug/L ug/L	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	
Di-n-butyi phthalate	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	
Fluoranthene	ue/L	ND 10	ND 10	ND 10	ND 10	ND 10	
Pyrene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	
Butylbenzylphthalate Benzo(a)anthracene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
3,3'-Dichlorobenzidine	ug/L ug/L	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10	ND 10	
Chrysene	ug/L	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	
Bis(2-ethylhexyl)phthalate	ug/L	ND 10	1 J	ND 10	2 R	7 B	
Di-n-octyl phthalate	ug/L	ND 10	ND 10	ND 10	ND-10	ND 10	
Benzo(b)fluoranthene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	
Benzo(k)fluoranthene Benzo(a)pyrene	ug/L	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10	ND 10	
Indeno(1,2,3-cd)pyrene	ug/L ug/L	ND 10	OI UN	ND 10 ND 1	ND 10 ND 1	ND 10 ND 1	
Dibenz(a,h)anthracene	ug/L	ND I	ND 1	ND I	ND 1	ND I	
Benzo(g,h,i)perylene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	
1,2-Diphenyl-hydrazine	ug/L	ND 1	ND 1	ND 1	ND 1	ND 1	
Hexachlorobenzene	ug/L	0.080 J	ND 0.025	ND 0,025 L	ND 0.025 J	ND 0.025	
TAL Metals					·		
Aluminum	,,	2100					
Aluminum, dissolved	ug/L ug/L	3100 14000	2100 25	1000 J 77	440 J	410 J 140	
Antimony	ug/L	ND 3.0	ND 3.0	ND 2.9	110 ND 2.9	ND 2.9	
Antimony, dissolved	ug/L	ND 29	ND 2.9	ND 2.9	ND 2.9	ND 2.9	
Arsenic	ug/L	32	1.5	ND 2.4 L	3.6 L	4.0 L	
Arsenic, dissofved Barium	ug/L	300	ND 1.5	ND 1.5	2.8	3.4	
Barium Barium, dissolved	ug/L ug/L	37 280	100 86	78	30	29	
Beryllium	ug/L ug/L	ND 0.21	ND 0.21	54 0.32	22 ND 0.30	23 ND 0.30	
Beryllium, dissolved	ug/L	ND 2.0	ND 0.20	ND 0.20	ND 0.30	ND 0.20	
Cadmium	ug/L	ND 0.21	ND 0.21	ND 0.50	ND 0.50	ND 0.50	
Cadmium, dissolved	ug/L	ND 2.0	ND 0.20	ND 0.20	ND 0.20	ND 0.20	
Calcium	ug/L	14000	27000	19000	30000	30000	WWW.
Calcium, dissolved Chromium	ug/L	140000	27000	18000	28000	30000	
-mviiium	ug/L	41	3.3	2.6	2.9	2.5	W. E

ANALYTICAL RESULTS SUMMARY - GROUNDWATER SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Date Printed: May 12, 1999

Page 9 (d)

Sample Date: <u>12/15/1998</u> <u>12/16/1998</u> <u>01/26/1999</u> <u>01/26/1999</u> <u>01/26/1999</u>	
<u>Parameters</u> <u>Units</u>	
TAL Metais (Cont'd)	
Chromium, dissolved ug/L 350 ND 0.70 0.84 B 1.9 B 2.2 B	
Cobalt ug/L ND 1.9 3.4 4.9 ND 3.6 ND 3.6	148828024.4 20200110. T
Cobalt, dissolved ug/L ND 19 ND 1.9 4.5 ND 1.9 ND 1.9	
Copper ug/L 2.0 7.3 9.3 12 11 Copper, dissolved ug/L 11 B 1.3 B 4.5 B 11 B 11 B	
Iron ug/L 720 3900 3500 500 430	
Iron, dissolved ug/L 250 B 25 B 1000 J 48 B 39 B	
Lead ug/L 1.4 K 5.1 K 2.5 ND 1.0 1.5 Lead, dissolved ug/L ND 10 ND 1.0 ND 1.0 ND 1.0	
Magnesium ug/L 9800 20000 14000 9700 9200	
Magnesium, dissolved ug/L 91000 20000 17000 9000 9700	
Manganese ug/L 140 830 950 68 67 Manganese, dissolved ug/L 580 760 1100 9.0 9.5	nia transcria de la compania. Nia transcria tras des della colonia.
Manganese, dissolved ug/L 580 760 1100 9.0 9.5 Mercury ug/L 100 1.0 9.7 1.6 1.8	
Mercury, dissolved ug/L 23 0.25 0.49 0.30 0.33	
Nickel ug/L 3.2 6.6 5.7 ND 3.2 ND 3.2	randa inde sona sone est i sone est. Sonapara
Nickel, dissolved ug/L 26 2:7 4:9 3:1 3:1 Potassium - ug/L 430000 44000 60000 130000 120000	
Potassium, dissolved vg/L: 400000 46000 62000 J 110000 J 120000 J	
Selenium ug/L 2.7 L ND 2.5 L ND 1.9 ND 1.9	en mengayan serenan kanan kanan serena Kanan mengayan serenan kanan kanan serena
Selenium, dissolved ug/L 63 ND 2.4 ND 2.4 ND 2.4 Silver ug/L ND 0.61 ND 0.61 0.63 0.79 ND 0.60	
Silver, dissolved ug/L ND 6.0 ND 0.60 ND 0.60 ND 0.60	arene en en en en en en en en en en en en
Sodium ug/L 1200000 200000 430000 93000 83000	Laboration many Laborate public
Sodium, dissolved ug/L 1100000 210000 420000 92000 98000 Thallium ug/L ND 1.9 ND 1.2 ND 1.2 ND 1.2	
Thallium ug/L ND 1.9 ND 1.2 ND 1.2 ND 1.2 Thallium, dissolved ug/L ND 19 ND 1.9 5.0 ND 1.9 2.0 B	20000000000000000000000000000000000000
Vanadium ug/L 92 8.7 9.5 18 16	
Vanadium, dissolved ug/L 920 ND 2.1 ND 2.1 15 16	
Zinc ug/L 17 B 42 120 47 48 Zinc, dissolved ug/L 110 J 21 B 67 7,6 B 9,4 B	takhokent.akira
	998648999999998999999999999999999999999
General Chemistry	
Chloride mg/L	
Sulfate mg/L	
Total suspended solids mg/L 41 77 120 16 24	
Total hardness mg/L 90 170 340 360 400	

Notes

NDx	- Not detected at or above x.
J	- Estimated.
	 VOCs collected on 08/18/98 for SB-13 and SB-13 Dupl.
-	- Not applicable.
K	- Value is estimated indicating a potential high bias.
L	- Value is estimated indicating a potential low bias.
В	- Analyte was present in an associated blank, indicating probable contamination.
R	- Rejected.
Dupl.	- Field duplicate,

- Total and dissolved mercury samples for A-17 were re-collected on 4/23/99.

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION

Page I (a)

Date Printed: May 12, 1999

Time Printed: 2:17 pm

OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Samole Location: SD-1 SD-2 SD-2 SD-3 SD-4 SD-5 SD-6 SD-7 Samola Depth: Sample Date: 12/17/1998 12/17/1998 12/17/1998 12/17/1998 12/16/1998 12/16/1998 12/15/1998 12/15/1998 Dupl. **Parameters** <u>Units</u> TCL Volatiles Chloromethane ug/Kg ND 19 ND 15 ND 16 ND 16 ND 20 I ND 18 ND 23 J ND 20 Bromomethane ND 19 ND 15 ND 16 ND 16 ug/Kg ND 20 J ND 18 ND 23 J ND 20 Vinyl chloride ug/Kg ND 19 ND 15 ND 16 ND 16 ND 20 J ND 18 ND 23 J ND 20 Chloroethane ug/Kg ND 19 ND 15 ND 16 ND 16 ND 20 J ND 18 ND 23 J ND 20 Methylene chloride 7 B 10 B ug/Kg 8 B 10 B 8 B 5 B 8 B 42 B Acetone ND 19 J 88 B ND 20 J 54 B ug/Kg 83 B 76 B 52 B ND 20 ND 16 Carbon disulfide ND 19 ND 16 ug/Kg ND 15 ND 20 J ND 18 ND 23 J ND 20 1.1-Dichloroethene ND 16 ND 19 ND 15 ND 16 ND 20 J ND 18 ug/Kg ND 23 1 ND 20 1.1-Dichloroethane ug/Kg ND 19 ND 15 ND 16 ND 16 ND 20 J ND 18 ND 23 J ND 20 1.2-Dichloroethene (total) ND 16 ND 19 ND 15 ND 16 ND 20 J ND 18 ND 23 J ND 20 ug/Kg 2-Butanone (MEK) ug/Kg ND 19 ND 15 ND 16 ND 16 ND 20 J ND 18 J ND 23 J ND 20 Chloroform ug/Kg ND 19 ND 15 2 1 4 B 3 B ∞3 B 1.2-Dichloroethane ND 19 ND 16 ND 18 ug/Kg ND 15 ND 16 ND 20 J ND 23 J ND 20 1.1.1-Trichloroethane ug/Kg ND 19 ND 15 ND 16 ND 16 ND 20 J ND 18 ND 23 J ND 20 Carbon tetrachloride ug/Kg ND 19 ND 15 ND 16 ND 16 ND 20 J ND 18 ND 23 J **ND 20** Bromodichloromethane ug/Kg ND 19 ND 15 ND 16 ND 16 ND 20 J ND 18 ND 23 J ND 20 1,2-Dichloropropane ug/Kg ND 19 ND 15 ND 16 ND 16 ND 20 1 ND 18 ND 23 J ND 20 cis-1.3-Dichloropropene ND 19 ND 15 ND 16 ND 16 ND 20 J ug/Kg ND 18 ND 23 I ND 20 Trichloroethene ug/Kg ND 19 ND 15 ND 16 ND 16 2 J ND 18 ND 23 J ND 20 Benzene ug/Kg ND 19 ND 15 ND 16 ND 16 ND 20 J ND 18 ND 23 J ND 20 Dibromochloromethane ND 19 ND 15 ug/Kg ND 16 ND 16 ND 20 J ND 18 ND 23 J ND 20 J trans-1.3-Dichloropropene ND 20 J ug/Kg ND 19 ND 15 ND 16 ND 16 ND 18 ND 23 J ND 20 1,1,2-Trichloroethane ug/Kg ND 19 ND 15 ND 16 ND 16 ND 20 J ND 18 ND 23 J ND 20 J Bromoform ND 19 ND 15 ND 16 ND 20 J ug/Kg ND 16 ND 20 J ND 18 ND 23 J 4-Methyl-2-pentanone (MIBK) ug/Kg ND 19 ND 15 ND 16 ND 16 ND 20 J ND 18 ND 23 J ND 20 J 2-Hexanone ND 19 ND 15 ND 16 ug/Kg ND 16 ND 20 J ND 18 ND 23 1 ND 20 J Tetrachloroethene ug/Kg ND 19 ND 16 ND 16 32 J 5 B ND 23 J 1.1.2.2-Tetrachloroethane ND 19 ND 15 ND 16 ND 20 J ug/Kg ND 16 ND 18 ND 23 J ND 20 J Toluene ND 19 ND 16 ug/Kg ND 15 ND 16 ND 20 J ND 18 ND 23 J ND 20 J Chlorobenzene ug/Kg 13 ND 4 4 J ND 5 ND 6 J ND 5 ND 7 J ND 6 J Ethylbenzene ND 19 ND 16 ug/Kg ND 15 **ND 16** ND 20 J ND 18 ND 23 J ND 20 J Styrene ug/Kg ND 19 ND 15 ND 16 ND 16 ND 20 J ND 18 ND 23 J ND 20 J Xylenes (total) ug/Kg ND 19 ND 15 ND 16 ND 16 ND 20 J ND 18 ND 23 J ND 20 J TCL Semi-volatiles Phenol 6 ND 640 ug/Kg ND 540 ND 530 ND 500 ND 680 J ND 600 ND 780 I ND 650

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE AUGUST 1998 - APRIL 1999

Page 1 (b)

Date Printed: May 12, 1999

Sample Location:		SD-I	SD-2	\$D-2	SD-3	SD-4	SD-5	SD-6	SD-7
Sample Depth:					_				
Sample Date:		12/17/1998	12/17/1998	12/17/1998	12/17/1998	12/16/1998	12/16/1998	12/15/1998	12/15/1998
					14/1//1///	12,10,1320	12/10/1998	12/15/1590	12/13/1770
D				Dupi.					
<u>Parameters</u>	<u>Units</u>								
TCL Semi-volatiles (Cont'd)									
Bis(2-chloroethyl)ether	ug/Kg	ND 190	ND 150	ND 160	ND 160	ND 210 J	ND 180	ND 240 J	ND 200
2-Chlorophenol	ug/Kg	ND 640	ND 500	ND 540	ND 530	ND 680 J	ND 600	ND 780 J	ND 650
1,3-Dichlorobenzene 1,4-Dichlorobenzene	ug/Kg	710 3000	ND 500	ND 540	ND 530	ND 680 J	ND 600	97 J	ND 650
1,2-Dichlorobenzene	ug/Kg ug/Kg	3000 290 J	ND 500 ND 500	ND 540 ND 540	ND 530 ND 530	ND 680 J	ND 600	550 J	220 1
2-Methylphenol	ug/Kg	ND 640	ND 500	ND 540	ND 530	ND 680 J ND 680 J	ND 600 ND 600	96 J ND 780 J	ND 650 ND 650
2,2'-Oxybis(1-chloropropane)	ug/Kg	ND 640	ND 500	ND 540	ND 530	ND 680 J	ND 600	ND 780 J	ND 650
4-Methylphenol	ug/Kg	ND 640	ND 500	ND 540	ND 530	71 1	ND 600	ND 780 J	ND 650
N-nitroso-di-n-propylamine	ug/Kg	ND 640	ND 500	ND 540	ND 530	ND 680 J	ND 600	ND 780 J	ND 650
Hexachloroethane	ug/Kg	ND 640	ND 500	ND 540	ND 530	ND 680 I	ND 600	ND 780 J	ND 650
Nitrobenzene	ug/Kg	ND 640	ND 500	ND 540	ND 530	ND 680 J	ND 600	ND 780 J	ND 650
Isophorone	ug/Kg	ND 640	ND 500	ND 540	ND 530	ND 680 J	ND 600	ND 780 J	ND 650
2-Nitrophenol 2,4-Dimethylphenol	ug/Kg	ND 640 ND 640	ND 500	ND 540	ND 530	ND 680 J	ND 600	ND 780 J	ND 650
Bis(2-chloroethoxy)methane	ug/Kg	ND 640 ND 640	ND 500	ND 540	ND 530	ND 680 J	ND 600	ND 780 J	ND 650
2,4-Dichlorophenol	ug/Kg ug/Kg	ND 640	ND 500 ND 500	ND 540 ND 540	ND 530 ND 530	ND 680 J	ND 600	ND 780 J	ND 650
1,2,4-Trichlorobenzene	ug/Kg	420 J	ND 500	ND 540	ND 530	ND 680 J ND 680 J	ND 600 ND 600	ND 780 J ND 780 J	ND 650
Naphthalene	ug/Kg	84 j	ND 500	ND 540	79 J	110 1	ND 600	ND 780 J	ND 650 83 J
4-Chloroaniline	ug/Kg	ND 640	ND 500	ND 540	ND 530	ND 680 J	ND 600	ND 780 J	83 J ND 650
Hexachlorobutadiene	ug/Kg	ND 640	ND 500	ND 540	ND 530	ND 680 J	ND 600	ND 780. J	ND 650
4-Chloro-3-methylphenol	ug/Kg	ND 640	ND 500	ND 540	ND 530	ND 680 J	ND 600	ND 780 J	ND 650
2-Methylnaphthalene	ug/Kg	ND 640	ND 500	ND 540	ND 530	ND 680 J	ND.600	ND 780 J ×	ND 650
Hexachlorocyclopentadiene	ug/Kg	ND 640	ND 500	ND 540	ND 530	ND 680 J	ND 600	ND 780 J	ND 650
2,4,6-Trichlorophenol 2,4,5-Trichlorophenol	ug/Kg	ND 640	ND 500	ND 540	ND 530	ND 680 J	ND 600	ND 780 J	ND 650
2-Chloronaphthalene	ug/Kg ug/Kg	ND 1500 ND 640	ND 1200 ND 500	ND 1300	ND 1300	ND 1600 J	ND 1400	ND 1900 J	ND 1600
2-Nitroaniline	ug/Kg	ND 1300	ND 300 ND 990	ND 540 ND 1100	ND 530	ND 680 J	ND 600	ND 780 J	ND 650
Dimethyl phthalate	ug/Kg	\$6000000000000000000000000000000000000	ND 500	ND 1100 ND 540	ND 1100 ND 530	ND 1300 J ND 680 J	ND 1200 ND 600	ND 1500 J ND 780 J	ND 1300
Acenaphthylene	ug/Kg	ND 640	ND 500	ND 540	ND 530	ND 680 J	ND 600	ND 780 J ND 780 J	ND 650 ND 650
2,6-Dinitrotoluene	ug/Kg	ND 640	ND 500	ND 540	ND 530	ND 680 J	ND 600	ND 780 J	ND 650
3-Nitroaniline	ug/Kg	ND 1300	ND 990 _	ND 1100	ND 1100	ND 1300 J	ND 1200	ND 1500 J	ND 1300
Acenaphthene	ug/Kg	ND 640	ND 500	ND 540	ND 530	ND 680 J	ND 600	ND 780 J	ND 650
2,4-Dinitrophenol	ug/Kg	ND 1300	ND 990	ND 1100	ND 1100	ND 1300 J	ND 1200	ND 1500 J	ND 1300
4-Nitrophenol	ug/Kg	ND 1300	ND 990	ND 1100	ND 1100	ND 1300 J	ND 1200	ND 1500 J	ND 1300
Dibenzofuran	ug/Kg	ND 640	ND 500	ND 540	ND 530	ND 680 J	ND 600	ND 780 J	ND 650
2,4-Dinitrotoluene	ug/Kg	ND 640	ND 500	ND 540	ND 530		ND 600	ND 780 J	ND 650
Diethyl phthalate	ug/Kg	ND 640	ND 500	ND 540	ND 530	ND 680 J	ND 600	ND 780 J	ND 650

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION

Page 1 (c)

Date Printed: May 12, 1999

Time Printed: 2:17 pm

OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Samole Locations SD-1 SD-2 SD-2 SD-3 SD-4 SD-5 SD-6 SD-7 Sample Depth: Samole Date: 12/17/1998 12/17/1998 12/17/1998 12/17/1998 12/16/1998 12/16/1998 12/15/1998 12/15/1998 Dupl. **Parameters** Units TCL Semi-volatiles (Cont'd) Fluorene ug/Kg ND 640 ND 500 ND 540 ND 530 ND 680 J ND 600 ND 780 J ND 650 4-Chlorophenyl phenylether ND 640 ug/Kg ND 500 ND 540 ND 530 ND 680 J ND 600 ND 780 J ND 650 4-Nitroaniline ND 1300 ug/Ke ND 990 ND 1100 ND 1100 ND 1300 J ND 1200 ND 1500 J ND 1300 4,6-Dinitro-2-methylphenol ug/Kg ND 1300 ND 990 ND 1100 ND 1100 ND 1300 J ND 1200 ND 1500 J ND 1300 N-nitrosodiphenylamine ND 640 ug/Kg ND 500 ND 540 ND 530 ND 680 J ND 600 ND 780 J ND 650 4-Bromophenyl phenylether ug/Kg ND 640 ND 500 ND 540 ND 600 ND 530 ND 680 J ND 780 J ND 650 Pentachlorophenol ND 1300 ug/Kg ND 990 ND 1100 ND 1100 ND 1300 I ND 1200 ND 1500 J ND 1300 Phenanthrene ug/Kg 100. J ND 500 ND 540 70 J 100 J ND 600 88 J 91 J Anthracene ND 640 ue/Kg ND 500 ND 540 ND 530 ND 680 J ND 600 ND 780 J ND 650 Carbazole ug/Kg ND 640 ND 500 ND 540 ND 530 ND 680 J ND 600 ND 780 J ND 650 Di-n-butyl phthalate ND 640 ug/Kg ND 500 ND 540 ND 530 ND 680 J ND 600 ND 780 J ND 650 Fluoranthene ug/Kg 200 J ND 500 ND 540 74 J 110 J ND 600 130 J 110 J Pyrene 190 J ug/Kg ND 500 ND 540 62 1 ND 600 93 J 96 J 83 J Butylbenzylohthalate ND 640 ug/Kg ND 500 ND 540 ND 530 ND 680 J ND 600 ND 780 J ND 650 Benzo(a)anthracene ug/Kg 160 J ND 500 ND 540 ND 530 ND 680 J ND 600 ND 780 J ND 650 3.3'-Dichlorobenzidine ND 640 ug/Kg ND 500 ND 540 ND 530 ND 680 J ND 600 ND 780 J ND 650 Chrysene 220 J ug/Kg ND 500 ND 540 58 71 1 ND 600 83 J 70 J Bis(2-ethylhexyl)phthalate 140 J ug/Kg ND 500 ND 540 ND 530 110 J ND 600 590 J 110 J Di-n-octyl phthalate ug/Kg ND 640 ND 500 ND 540 ND 530 ND 680 J ND 600 ND 780 J ND 650 Benzo(b)fluoranthene ug/Kg 220 ND 500 ND 540 ND 530 ND 680 J ND 600 ND 780 J ND 650 Benzo(k)fluoranthene ug/Kg 180 J ND 500 ND 540 ND 530 ND 680 J ND 600 ND 780 J ND 650 Benzo(a)pyrene ug/Kg 210 J ND 500 ND 540 ND 530 ND 680 J 86 J ND 780 J 140 J Indeno(1,2,3-cd)pyrene 98 1 ug/Kg ND 500 ND 540 ND 530 ND 680 I ND 600 ND 780 J ND 650 Dibenz(a,h)anthracene ND 640 ug/Kg ND 500 ND 540 ND 530 ND 680 J ND 600 ND 780 J ND 650 Benzo(g,h,i)perylene ug/Kg 94 J ND 500 ND 540 ND 530 ND 680 J ND 600 ND 780 J ND 650. 1,2-Diphenyl-hydrazine ug/Kg ND 640 ND 500 ND 540 ND 530 ND 680 J ND 600 ND 780 J ND 650 Hexachlorobenzene ug/Kg TAL Metals Aluminum mg/Kg 14000 21000 24000 22000 21000 J 24000 19000 J 18000 Antimony mg/Kg ND 0.56 L ND 0.44 L ND 0.47 L ND 0.46 L 2.1 JL ND 0.52 L ND 0.68 JL ND 0.57 L Arsenic mg/Kg 11 12 10 12 36 J 7.9 18 J 8.7 Barium mg/Kg 120 86 96 87 110 J 81 79 J 64 Beryllium mg/Kg 1.9 1.1 1.4 1.4 1.4 J 1.1 J 1.1 1.1 Cadmium mg/Kg ND 0.096 L ND 0.38 L ND 0.16 L ND 0.16 L ND 0.10 JL ND 0.18 L ND 0.12 JL ND 0.20 L

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 1 (d)

Date Printed: May 12, 1999

Sample Location;		SD-1	SD-2	SD-2	SD-3	SD-4	SD-5	SD-6	SD-7
Sample Depth:						-			
Sample Date:		12/17/1998	12/17/1998	12/17/1998	12/17/1998	12/16/1998	12/16/1998	12/15/1998	12/15/1998
-			12/11/1250		12/11/11/96	12/10/1990	12/10/1996	12/13/1996	12/13/1996
				Dupl.					
<u>Parameters</u>	Units								
TAL Metals (Cont'd)									
Calcium	mg/Kg	1100	1500	. 1700	1600	2300 J	1700	3100 J	2800
Chromium	mg/Kg	32	45	52	55	99 J	52	62 J	52
Cobalt	mg/Kg	13	14	16	13	17 J	11	20 J	16
Copper	mg/Kg	20	14	16	23	78 1	15	29 J	20
Iron Lead	mg/Kg	23000	33000	39000	30000	40000 J	32000	34000 J	37000
Magnesium	mg/Kg mg/Kg	29 2200	19 5600	19 6400	32 5900	120 J	16	40 J	24
Manganese	mg/Kg	2200 190	290	340 340	5800 260	5600 J 580 J	6600	6300 J	6400
Mercury	mg/Kg	0.65	0.18	0.19	ND 0.070	1.3 J	260 ND 0.81	780 J 9.4 J	740 0.52
Nicke)	mg/Kg	24	25	28	26	32 1	25		30
Potassium	mg/Kg	960 J	_ 3600 J	4000 J	2400 J	2700 J	2900 J	3000 J	3400 J
Selenium	mg/Kg	1,6	1.5	1.5	1.5	3.0 1	0.62	2.2 J	1.6
Silver	mg/Kg	0.86 L	1.2 L	1.3 L	1.0 L	2.1 JL	1.1 L	1.5 JL	
Sodium Thallium	mg/Kg	160	1400	1500	790	1000 J	860	1200 J	1700
Vanadium	mg/Kg mg/Kg	1.5 B	1.9 B	2.0 B	1.6 B	1.7 B	1.6 B	1.5 B	1.8 B
Zinc	mg/Kg	72 220	56 160	60 190	52 160	57 J 520 J		78 J	51
Methyl mercury	ug/Kg	0.73	1.9	i,7	0.56	0.65 1	0.14	220 J 4.1 I	190 3.0
	**************************************	a visita e como con constitue de la como constitue	**************************************				**************************************		330
General Chemistry									
Ammonia	mg/Kg	46	. 49	6 1	5 22	0. 1			
Sulfide	mg/Kg	ND 31	ND 24	51 ND 26	73 ND 26	21 J ND 33 JL	23 ND 29	50 J ND 37 JL	44 ND 31
Coarse gravel (19.0 mm)	%	0.00	0.00	0.00	0.00	0.00 J	0.00	0.00 J	0.00
Fine gravel (4.75 mm)	7	0.00	0,00	Ø.CD	0.00	0.00 j	0.00	0.00 J	0.00
Coarse sand (2.00 mm)	76	34	31	30	34	21 J	25	20 J	22
Medium sand (0.425 mm)	%	38	42	44	47	45 J	49	46 J	46
Fine sand (0.075 mm)	7,	18	19	16	15	21 J	17	24]	19
Silts/clays (<0.075 mm) Total organic carbon (TOC)	%	6.4	6.2	3.3	0.6	8.3 J	7.9	7.8 J	6.9
rotat organic carbon (TOC)	mg/Kg	630000	17000	16000	15000	53000 J	37000	59000 J	44000
	1								

AUGUST 1998 - APRIL 1999

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

Page 2 (a)

Date Printed: May 12, 1999

Time Printed: 2:17 pm

Sample Location:		SD-8	SD-9	SED-1	SED-2	SED-3	SED-4	SED-5	SED-6
Sample Depth:								**	
Sample Date;		12/15/1998	12/16/1998	08/06/1998	08/05/1998	08/05/1998	08/05/1998	08/04/1998	08/05/1998
<u>Parameters</u>	<u>Units</u>								
TCL Volatiles									
Chloromethane	ug/Kg	ND 22 J	ND 17	ND 13	ND 12	ND 14	ND 11	ND II	ND 12
Bromomethane	ug/Kg	ND 22 J	ND 17	ND 13	ND 12	ND 14	ND 11	ND 11	ND 12
Vinyl chloride Chloroethane	ug/Kg	ND 22 J	ND 17	ND 13	ND 12	ND 14	ND 11	ND 11	3 J
Methylene chloride	ug/Kg	ND 22 J	ND 17	ND 13	ND 12	ND 14	ND 11	ND 11	ND 12
Acetone	ug/Kg ug/Kg	11 B 250 J	7 B	3 B	4 B	2 B	2 B	7 B	3 B
Carbon disulfide	ug/Kg	ND 22 J	81 B ND 17	7 B ND 13	ND 12	4 B	ND 11	2 B	8 B
1.1-Dichloroethene	ug/Kg	ND 22 J	ND 17	ND 13	ND 12 ND 12	ND 14 ND 14	ND 11	i.J	1.1
1,1-Dichloroethane	ug/Kg	ND 22 J	ND 17	ND 13	ND 12 ND 12	ND 14 ND 14	ND 11 ND 11	ND 11	ND 12
1,2-Dichloroethene (total)	ug/Kg	ND 22 J	ND 17	ND 13	ND 12	ND 14 ND 14	ND 11 ND 11	ND 11 ND 11	ND 12
2-Butanone (MEK)	ug/Kg	100 J	ND 17 J	ND 13	ND 12	ND 14	ND II	ND II	ND 12 ND 12
Chloroform	ug/Kg	5 B	3 Ј	5 I	. 1 J	11 J	ND 11	ND II	47 J
1,2-Dichloroethane	ug/Kg	ND 22 J	ND 17	ND 13	ND 12	ND 14	ND II	ND 11	ND 12
1,1,1-Trichloroethane	ug/Kg	ND 22 J	ND 17	ND 13	ND 12	ND 14	ND II	ND 11	ND 12
Carbon tetrachloride	ug/Kg	ND 22 J	ND 17	ND 13	ND 12	6 J	ND 11	ND 11	ND 12
Bromodichloromethane	ug/Kg	ND 22 J	ND 17	ND 13	ND 12	ND 14	ND 11	ND 11	ND 12
1,2-Dichloropropane	ug/Kg	ND 22 J	ND 17	ND 13	ND 12	ND 14	ND 11	ND II	ND 12
cis-1,3-Dichloropropene Trichloroethene	ug/Kg	ND 22 J	ND 17	ND 13	ND 12	ND 14	ND 11	ND 11	ND 12
Benzene	ug/Kg	ND 22 J	ND 17	ND 13	ND 12	ND 14	ND 11	ND 11	2 J
Dibromochloromethans	ug/Kg ug/Kg	ND 22 J 8 J	ND 17 ND 17	ND 13	ND 12	ND 14	ND 11	ND 11	2900
trans-1,3-Dichloropropene	ug/Kg	ND 22 J	ND 17 ND 17	ND 13 ND 13	ND 12	ND 14	ND 11	ND 11	ND 12
1,1,2-Trichloroethane	ug/Kg	ND 22 1	ND 17	ND 13	ND 12 ND 12	ND 14 ND 14	ND 11	ND 11	ND 12
Вготобогт	ug/Kg	ND 22 J	ND 17	ND 13	ND 12 ND 12	ND 14 ND 14	ND 11 ND 11	ND () ND 11	ND 12
4-Methyl-2-pentanone (MIBK)	ug/Kg	ND 22 J	ND 17	ND 13	ND 12 ND 12	ND 14 ND 14	II DN	ND 11	ND 12
2-Hexanone	ug/Kg	ND 22 J	ND 17	ND 13	ND 12	ND 14	ND 11	ND 11	ND 12 ND 12
Tetrachloroethene	ug/Kg	6 B	ND 17	18		``````````````````````````````````````	ildn		ND 12 ND 12
1,1,2,2-Tetrachloroethane	ug/Kg	ND 22 J	ND 17	ND 13	ND 12	ND 14	ND 11	ND 11	ND 12
Toluene	ug/Kg	ND 22 J	ND 17	ND 13	ND 12	ND 14	ND 11	ND 11	
Chlorobenzene	ug/Kg	ND 6 J	ND 5	2 J	4 J	ND 4	ND 3	ND 3	15000
Ethylbenzene	ug/Kg	ND 22 J	ND 17	ND 13	ND 12	ND 14	ND II	ND II	ND 12
Styrene	ug/Kg	ND 22 J	ND 17	ND 13	ND 12	ND 14	ND 11	ND 11	ND 12
Xylenes (total)	ug/Kg	ND 22 J	ND 17	ND 13	ND 12	ND 14	ND 11	ND 11	1.1
TCL Semi-volatiles									
Phenol	ug/Kg	ND 720 J	ND 550	ND 430 J	ND 410	ND 450	ND 380	ND 380	ND 390

SU:\DBASEGRP\CHEM\7000\7462\Sa) Anal - SO/SE - Target Analyses

05/10/99

AUGUST 1998 - APRIL 1999

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

Page 2 (b)

Date Printed: May 12, 1999

Sample Location:		SD-8	SD-9	SED-1	SED-2	SED-3	SED-4	SED-5	SED-6
Sample Depth:		-							
Sample Date:		12/15/1998	12/16/1998	08/06/1998	08/05/1998	08/05/1998	08/05/1998	08/04/1998	08/05/1998
				00,00,1222	00/05/1250		00/05/1998	00/04/1998	06/03/1998
Parameters	<u>Units</u>								
TCL Semi-volatiles (Cont'd)									
Bis(2-chloroethyl)ether	ug/Kg	ND 220 J	ND 170	ND 130	ND 120	ND 140	ND 110	ND 120	ND 120
2-Chlorophenol	l ug/Kg	ND 720 J	ND 550	ND 430 J	ND 410	ND 450	ND 380	ND 380	ND 390
1,3-Dichlorobenzene	ug/Kg	96 1	ND 550	ND 430	ND 410	120 J	ND 380	ND 380	1200
1,4-Dichlorobenzene 1,2-Dichlorobenzene	ug/Kg	650 J	62 J	210	160 J	1600 J	ND 380	ND 380	6500
2-Methylphenol	ug/Kg ug/Kg	160 J ND 720 J	ND 550 ND 550	66 J ND 430	ND 410	280 J	ND 380	ND 380	5300
2,2'-Oxybis(1-chloropropage)	ug/Kg	ND 720 J	ND 550 ND 550	ND 430 ND 430	ND 410 ND 410	ND 450 ND 450	ND 380	ND 380	ND 390
4-Methylphenol	ug/Kg	ND 720 J	ND 550	ND 430	ND 410	ND 450	ND 380 ND 380	ND 380 ND 380	ND 390 ND 390
N-mitroso-di-n-propylamine	ug/Kg	ND 720 J	ND 550	ND 430 J	ND 410	ND 450	ND 380	ND 380	ND 390
Hexachloroethane	ug/Kg	ND 720 J	ND 550	290 J	65 J	240 J	ND 380	ND 380	ND 390
Nitrobenzene	ug/Kg	ND 720 J	ND 550	ND 430	ND 410	ND 450	ND 380	ND 380	ND 390
Isophorone	ug/Kg	ND 720 J	ND 550	ND 430	ND 410	ND 450	ND 380	ND 380	ND 390
2-Nitrophenol	ug/Kg	ND 720 J	ND 550	ND 430	ND 410	ND 450	ND 380	ND 380	ND 390
2,4-Dimethylphenol Bis(2-chloroethoxy)methane	ug/Kg	ND 720 J	ND 550	ND 430	ND 410	ND 450	ND 380	ND 380 ·	ND 390
2,4-Dichlorophenol	ug/Kg	ND 720 1	ND 550	ND 430	ND 410	ND 450	ND 380	ND 380	ND 390
1,2,4-Trichlorobenzene	ug/Kg ug/Kg	ND 720 J 81 J	ND 550 ND 550	ND 430 96 J	ND 410	ND 450	ND 380	ND 380	ND 390
Naphthalene	ug/Kg	ND 720 J	ND 550	70 <i>J</i> ND 430	67 J ND 410	520 110 J	ND 380	46 J	260 J
4-Chloroaniline	ug/Kg	ND 720 J	ND 550	ND 430	ND 410	ND 450	ND 380 ND 380	ND 380 ND 380	ND 390 ND 390
Hexachlorobutadiene	ug/Kg	ND 720 J	ND 550	140 J	ND 410	84 J	ND 380	ND 380	ND 390
4-Chloro-3-methylphenol	ug/Kg	ND 720 J	ND 550	ND 430 J	ND 410	ND 450	ND 380	ND 380	ND 390
2-Methylnaphthalene	ug/Kg	ND 720 J	· ND 550	ND 430	ND 410	160 J	ND 380	ND 380	ND 390
Hexachlorocyclopentadiene 2,4,6-Trichlorophenol	ug/Kg	ND 720 J	ND 550	ND 430	ND 410	ND 450	ND 380	ND 380	ND 390
2,4,5-Trichlorophenol	ug/Kg ug/Kg	ND 720 J ND 1700 J	ND 550	48 J	ND 410	ND 450	ND 380	ND 380	ND 390
2-Chloronaphthalene	ug/Kg	ND 7700 J ND 720 J	ND 1300 ND 550	ND 1000	ND 990	ND 1100	ND 910	ND 920	ND 940
2-Nitroaniline	ug/Kg	ND 1400 J	ND 1100	ND 430 ND 840	ND 410 ND 810	ND 450	ND 380	ND 380	ND 390
Dimethyl phthalate	ug/Kg	ND 720 J	ND 550	340 J	ND 810 62 J	ND 890 400 J	ND 750 ND 380	ND 760 ND 380	ND 770
Acenaphthylene	ug/Kg	ND 720 J	ND 550	ND 430	ND 410	ND 450	ND 380	ND 380	ND 390 ND 390
2,6-Dinitrotoluene	ug/Kg	ND 720 J	ND 550	ND 430	ND 410	ND 450	ND 380	ND 380	ND 390 ND 390
3-Nitroaniline	ug/Kg	ND 1400 J	ND 1100	ND 840	ND 810	ND 890	ND 750	ND 760	ND 770
Acenaphthene	ug/Kg	ND 720 J	ND 550	ND 430	ND 410	62 J	ND 380	ND 380	ND 390
2.4-Dinitrophenol	ug/Kg	ND 1400 J	ND 1100	ND 840	ND 810	ND 890	ND 750	ND 760	ND 770
4-Nitrophenol Dibenzofuran	ug/Kg	ND 1400 J	ND 1100	ND 840	ND 810	ND 890	ND 750	ND 760	ND 770
2,4-Dinitrotoluene	ug/Kg	ND 720 J	ND 550	ND 430	ND 410	61 J	ND 380	ND 380	ND 390
Diethyl phthalate	ug/Kg	ND 720 J	ND 550	ND 430	ND 410	ND 450	ND 380	ND 380	ND 390
	ug/Kg	ND 720 J	ND 550	ND 430	ND 410	ND 450	ND 380	ND 380	ND 390

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION

DELAWARE CITY, DELAWARE AUGUST 1998 - APRIL 1999 Page 2 (c)

Date Printed: May 12, 1999

Time Printed: 2:17 pm

Sample Location:		SD-8	SD-9	SED-1	SED-2	SED-3	SED-4	SED-5	SED-6
Sample Depth:					_				-
Sample Date:		12/15/1998	12/16/1998	08/06/1998	08/05/1998	08/05/1998	08/05/1998	_08/04/1998	08/05/1998
·					00/03/1330	08/03/1998	_08/03/1998_		08/03/1998
Parameters	Units								
									
TCL Semi-volatiles (Cont'd)									
Fluorene	ug/Kg	ND 720 J	ND 550	ND 430	ND 410	50 J	ND 380	ND 380	ND 390
Chlorophenyl phenylether Henylether	ug/Kg	ND 720 J	ND 550	ND 430	ND 410	ND 450	ND 380	ND 380	ND 390
4-Nitroaniine 4,6-Dinitro-2-methylphenol	ug/Kg	ND 1400 J	ND 1100	ND 840	ND 810	ND 890	ND 750	ND 760	ND 770
N-nitrosodiphenylamine	ug/Kg ug/Kg	ND 1400 J ND 720 J	ND 1100	ND 840	ND 810	ND 890	ND 750	ND 760	ND 770
4-Bromophenyl phenylether	ug/Kg	ND 720 J	ND 550 ND 550	ND 430 ND 430	ND 410 ND 410	ND 450 ND 450	ND 380	ND 380	ND 390
Pentachlorophenol	ug/Kg	ND 1400 J	ND 1100	270 J	ND 410 ND 810	ND 430 ND 890	ND 380	ND 380	ND 390
Phenanthrene	ug/Kg	ND 720 J	ND 550	130.1	160 J	440 J	ND 750 45 J	ND 760 47 J	ND 770 50 J
Anthracene	ug/Kg	ND 720 J	ND 550	ND 430	ND 410	73 J	ND 380	ND 380	ND 390
Carbazole	ug/Kg	ND 720 J	ND 550	ND 430	ND 410	ND 450	ND 380	ND 380	ND 390
Di-n-butyl phthalate	ug/Kg	ND 720 J	ND 550	100 J	50 J	220 J	ND 380	ND 380	ND 390
Fluoranthene	vg/Kg	ND 720 J	ND 550	190 J	260 J	360 1	54 J	57 J	96 J
Pyrene Butylbenzylphthalate	ug/Kg	ND 720 J	ND 550	170 J	280 J	610 J	53 J	47 J	120 J
Benzo(a)anthracene	ug/Kg	ND 720 J	ND 550	700	84 J	480 J	ND 380	43 J	ND 390
3,3'-Dichlorobenzidine	ug/Kg ug/Kg	ND 720 J ND 720 J	ND 550 ND 550	57 J ND 430	97 J ND 410	88 J	ND 380	ND 380	45 J
Chrysene	ug/Kg	ND 720 J	ND 550	120 J	ND 410 200 J	ND 450 220 J	ND 380	ND 380	ND 390
Bis(2-ethylhexyl)phthalate	ug/Kg	160 J	ND 550	1600	1200	5000	41 J 730	46 J 2900	68 J
Di-n-octyl phthalate	ug/Kg	ND 720 J	ND 550	ND 430	ND 410	310 J	ND 380	2900 990	1200 290 J
Benzo(b)fluoranthene	ug/Kg	ND 720 1	ND 550	110 J	170 J	13Ŏ J	ND 380	39 J	49 j
Benzo(k)fluoranthene	ug/Kg	ND 720 J	ND 550	81 J	150 J	88 J	ND 380	ND 380	59 J
Benzo(a)pyrene	ug/Kg	ND 720 J	NÐ 550	61 J	120 J	65 J	ND 380	ND 380	42 J
Indeno(1,2,3-cd)pyrene Dibenz(a;h)anthracene	ug/Kg	ND 720 J	ND 550	68 J	130 J	80 J	ND 380	ND 380	ND 390
Benzo(g,h,i)perylene	ug/Kg	ND 720 J	ND 550	ND 430	ND 410	ND 450	ND 380	ND 380	ND 390
1,2-Diphenyl-hydrazine	ug/Kg	ND 720 J	ND 550	89 J	160 J	160 J	ND 380	ND 380	ND 390
Ale Diprodiction	ug/Kg	ND 720 J	ND 550	ND 430	ND 410	ND 450	ND 380	ND 380	ND 390
Hexachlorobenzene	ug/Kg			750	110 J	2800	350 J	540	43 J
TAL Metals									
Aluminum	mg/Kg	17000 J			000000000000000000000000000000000000000	\$0\$000\$\$ccoccoccoccccccccccccccc	São São São São São São São São São São	en en en en en en en en en en en en en e	CONTROL MANAGEMENT AND A SECURITION OF THE SECUR
Antimony	mg/Kg mg/Kg	0,97 JL	21000 ND 0.48 L	2400	4200	14000	7500	6500	2600
Arsenic	mg/Kg	0.97 JL 24 J	ND 0.48 L. 9.4	0.49 JL 0.74 B	0.52 JL	2.3 JL	0.71 JL	1.7 JL	0.47 JL
Barium	mg/Kg	120 J	72	61	1,3 B 74	4.2 450	2.0 K	1.6 B	1.9 K
Beryllium	mg/Kg	17 1	0.95	0.18	0.21	450 0:87	4600 0.39	6600 0.36	60
Cadmium	mg/Kg	ND 0.22 JL	ND 0.17 L	0.28	0.63	2.8	1.3	0.88	0.32 0.25
		•		VV	0103	2.0	1.3	V.00	0.25

7U:\DBASEGRP\CHEM\7000\7462\5a) Anal - SO/SE - Target Analyses

05/10/99

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION

OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 2 (d)

Date Printed: May 12, 1999

Sample Location:	İ	SD-8	SD-9	SED-1	SED-2	SED-3	SED-4	SED-5	SED-6
Sample Depth:					-				
Sample Date:		12/15/1998	12/16/1998	08/06/1998	08/05/1998	08/05/1998	08/05/1998	08/04/1998	08/05/1998
Parameters	Units								
TAL Metals (Cont'd)	1								
Calcium	mg/Kg	1100 J	1700	1000	1900		Saldet leenne en en <u>al ander reë</u> r en		tacatilástarasáltástaszanssáltára szentsáltára
Chromium	mg/Kg	180 J	48	9.7 J	15 7	9700 83 J	4800 18 J	6500 12 J	820 12 J
Cobalt	mg/Kg	8.3 J	10	1.8	15 J 2.7	9.2	6.3	12 J 6.8	2.5
Copper	mg/Kg	29 J	12	35 JK	29 JK	84 JK	22 JK	12 JK	
iron Lead	mg/Kg	32000 J	27000	6900	9400	27000	14000	9400	9500
Magnesium	mg/Kg	43 J	13	26 J	28 J	100 J	18 JK	22 J	7.5 J
Manganese	mg/Kg mg/Kg	3200 J 160 J	5900 210	1000	1700	5000	2100	1300	500
Mercury	mg/Kg	140 J	ND 0.076	56 JK 86 J	100 JK 49 J	320 JK 520 J	180 JK	140 JK	80 JK
Nickel	mg/Kg	27 ј	21	16	82.	280	31 J 23	22 J	4.9 J
Potassium	mg/Kg	2300 J	3100 J	900	1900	7000	1200	38 1300	4.4 280
Selenium	mg/Kg	2.7 J	0.86 K	ND 0.26	0.33	0.60	0.32	0.49	ND 0.23
Silver Sodium	mg/Kg	1.2 JL	0.96 L	0.33 J	0.68 J	1,7 J	0.60 J	0,46 J	0.40 J
Thallium	mg/Kg	1800 J	870	140	180	1400	1300	850	83
Vanadium	mg/Kg mg/Kg	1,9 B 66 J	1.5 B	ND 0.23	0.30	0.42	ND 0.20	0.28	0.34
Zine	mg/Kg	110 j	54 88	11 270 J	18 340 J	45	21		12
Methyl mercury	ug/Kg	55 J	0.41			1600 J 	290 J 	180 J 	140]
General Chemistry									
Аттоліа	600.000.000.000.000.000.000.000.000.000	. Washington and a confidence	702.7008.7008.7000.0048.000						
Ammonia Sulfide	mg/Kg	ND 5.4 J	60	•	9-4	<u> -</u>			4- 04/00/00/00/00/00/00/00/00/00/00/00/00/0
Coarse gravel (19.0 mm)	mg/Kg %	ND 35 JL	ND 27		Waittenson				==
Fine gravel (4.75 mm)	76 %	t 00.0	0,00		••	· · · · · · · · · · · · · · · · · · ·	-	_	_
Coarse sand (2.00 mm)	70	20.3	0.00 22		 	== Post (Argon Louis Montanio Translation	 Con est vendesserronning	**************************************	
Medium sand (0.425 mm)	%: %	49 J	46		**************************************	· · · · · · · · · · · · · · · · · · ·		••	
Fine sand (0.075 mm)	70	20 1	iš			on a series I am			
Silts/clays (<0.075 mm)	%	7.0 J	7.9			vaca e saacu (2007) (2008) (2007) (2008) (2008) 	::::::::::::::::::::::::::::::::::::		
Total organic carbon (TOC)	mg/Kg	72000 J	34000	+			4		
						ners generalis attende trade state state (15 200000)	*****************************	verans escapadada (666) (666) (666) (40 × 4 × 5 20 40 × 10 20 40 20 20 20 20 × 10 20 70 20 20 20 70 20 20 20 20 20 20 20 20 20 20 20 20 20

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

Date Printed: May 12, 1999

Page 3 (a)

DELAWARE CITT, DELAWAR
AUGUST 1998 - APRIL 1999

Sample Location:		SED-7	SED-8	SED-9	SED-10	SED-10	SED-11	SED-12	SED-13
Sample Depth:								025 12	3LD-13
Sample Date:		08/05/1998	08/04/1998	08/06/1998	08/06/1998		00/04/11/00/1		**********
	ı	00/03/1390	00/04/1990	<u> </u>	08/06/1998	_ 08/06/1998_	<u>08/06/1998</u>	08/06/1998	08/06/1998
n						Dupl.			
Parameters	<u>Units</u>								
TCL Volatiles									
Chloromethane	ug/Kg	ND 12	ND 12	ND 13	ND 11	ND 11	ND 18	ND 22 1	NT 45
Bromomethane	ug/Kg	ND 12	ND 12	ND 13	ND 11	ND II	ND 18	ND 22 J ND 22 J	ND 17 ND 17
Vinyl chloride	ug/Kg	ND 12	ND 12	ND 13	ND 11	ND 11	4 J	78 J	ND 17
Chloroethane	ug/Kg	ND 12	ND 12	ND 13	ND 11	ND II	ND 18	ND 22 J	ND 17
Methylene chloride	ug/Kg	ND 12	3 B	3 B	ND 11	_ 2 B	5 B	6 B	3 B
Acetone	ug/Kg	ND 12	4 B	5 B	ND II		14 B	12 B	15 B
Carbon disulfide	ug/Kg	ND 12	ND 12	ND 13	ND 11	ND 11	4 J	2 J	ND 17
1,1-Dichlorgethene	ug/Kg	ND 12	ND 12	ND 13	ND II	ND 11	ND 18	ND 22 J	ND 17
1,1-Dichloroethane	ug/Kg	ND 12	ND 12	ND 13	ND 11	ND 11	ND 18	ND 22 J	ND 17
1,2-Dichloroethene (total)	ug/Kg	ND 12	ND 12	ND 13	ND 11	ND 11	13 J	ND 22 J	ND 17
2-Butanone (MEK)	ug/Kg	ND 12	ND 12	ND 13	ND 11	ND 11	19 J	10. J	5 J
Chloroform	ug/Kg	ND 12	ND 12	9.1	ND 11	ND II	15 J	56 J	ND 17
1,2-Dichloroethane 1,1,1-Trichloroethane	ug/Kg	ND 12	ND 12	ND 13	ND 11	ND 11	2 J	ND 22 J	ND 17
Carbon tetrachloride	ug/Kg	ND 12	ND 12	ND 13	ND 11	ND 11	ND 18	ND 22 J	ND 17
Bromodichloromethane	ug/Kg	ND 12	ND 12	ND 13	ND 11	ND 11	ND 18	ND 22 J	ND 17
1,2-Dichloropropane	ug/Kg	ND 12	ND 12	ND 13	ND 11	ND II	ND 18	ND 22 J	ND 17
cis-1,3-Dichloropropene	ug/Kg ug/Kg	ND 12 ND 12	ND 12	ND 13	ND II	ND 11	ND 18	ND 22 J	ND 17
Trichloroethene	ug/Kg ug/Kg	ND 12 ND 12	ND 12	ND 13	ND 11	ND 11	ND 18	ND 22 J	ND 17
Benzene	ug/Kg	18 18	ND 12	ND 13	ND 11	ND 11	3 J	6 J	ND 17
Dibromochloromethane	ug/Kg	ND 12	ND 12 ND 12	ND 13	ND 11	ND 11	ND 18	ND 22 J	ND 17
trans-1,3-Dichloropropene	ug/Kg	ND 12 ND 12	ND 12 ND 12	ND 13 ND 13	ND 11	ND 11	ND 18 J	ND 22 J	ND 17
1,1,2-Trichloroethane	ug/Kg	ND 12	ND 12 ND 12		ND 11	ND 11	ND 18	ND 22 J	ND 17
Bromoform	ug/Kg	ND 12 ND 12	ND 12	. ND 13	_ ND 11	ND 11	ND 18 J	ND 22 J	ND 17
4-Methyl-2-pentanone (MIBK)	ug/Kg	ND 12	ND 12	ND 13 ND 13	ND II	ND 11	ND 18-1	ND 22 J	ND 17
2-Hexanone	ug/Kg	ND 12	ND 12	ND 13	ND 11 ND 11	ND 11	ND 18 J	ND 22 J	ND 17
Tetrachloroethene	ug/Kg	ND 12	ND 12	4 J	3 J	ND 11 3 J	ND 18 J	ND 22 J	ND 17
1,1,2,2-Tetrachloroethane	ug/Kg	ND 12	ND 12	ND 13	NDIL	ND II	20 J	330 J	6 J
Toluene	ug/Kg	ND 12	ND 12	ND 13	ND 11	ND II	ND 18 J 8 J	ND 22 J	ND 17
Chlorobenzene	ug/Kg	1200	96	2 y	2.1	ND 3	, i	ND 22 J ND 7 J	ND 17
Ethylbenzene	ug/Kg	ND 12	ND 12	ND 13	ND 11	ND 11	ND 18 J	ND 7 J ND 22 J	2 J ND 17
Styrene	ug/Kg	ND 12	ND 12	ND 13	ND LI	ND 11	ND 18 J	ND 22 J	ND 17
Xylenes (total)	ug/Kg	ND 12	ND 12	ND 13	ND II	ND 11	ND 18 J	5 J	ND 17
TCL Semi-volatiles	,							J •	
Phenol	ug/Kg	ND 400	ND 400	ND 2200	ND 370	ND 380	ND 5800	ND 730 J	ND 5200
			es exerc expressed a contract of the property of the contract	CONTRACTOR TO THE THE THE CONTRACTOR OF THE CONT					141.3200

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION

Page 3 (b)

Date Printed: May 12, 1999

Time Printed: 2:17 pm

DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Sample Location:	I	SED-7	SED-8	SED-9	SED-10	SED-10	SED-11	SED-12	SED-13
Sample Depth:		••							
Sample Date:		08/05/1998	08/04/1998	08/06/1998	08/06/1998	08/06/1998	08/06/1998	08/06/1998	08/06/1998
•						Dupl.			
Parameters	<u>Units</u>					2 up			
Farameters	Oms								
TCL Semi-volatiles (Cont'd)									
Bis(2-chloroethyl)ether	ug/Kg	ND 120	ND 120	ND 660	ND 110	ND 110	ND 1700	ND 220 J	ND 1600
2-Chlorophenol	ug/Kg	ND 400	ND 400	ND 2200	ND 370	ND 380	ND 5800	ND 730 J	ND 5200
1,3-Dichlorobenzene 1,4-Dichlorobenzene	ug/Kg ug/Kg	40 J 520	220 J 1800	ND 2200 ND 2200	ND 370 ND 370	ND 380 ND 380	600 J 1500 J	ND 730 J ND 730 J	ND 5200 940 J
1,2-Dichlorobenzene	ug/Kg	460	240 J	ND 2200	ND 370	ND 380	930 J	ND 730 J	ND 5200
2-Methylphenol	ug/Kg	ND 400	ND 400	ND 2200	ND 370	ND 380	ND 5800	ND 730 J	ND 5200
2,2'-Oxybis(1-chloropropane)	ug/Kg	ND 400	ND 400	ND 2200	ND 370	ND 380	ND 5800	ND 730 J	ND 5200
4-Methylphenol	ug/Kg	ND 400	ND 400	ND 2200	ND 370	ND 380	ND 5800	86 J	ND 5200
N-nitroso-di-n-propylamine	ug/Kg	ND 400	ND 400	ND 2200	ND 370	ND 380	ND 5800	ND 730 J	ND 5200
Hexachloroethane Nitrobenzene	ug/Kg ug/Kg	ND 400 ND 400	ND 400 ND 400	ND 2200 ND 2200	ND 370 ND 370	ND 380 ND 380	ND 5800 ND 5800	99 J ND 730 J	ND 5200 ND 5200
Isophorone	ug/Kg	ND 400	ND 400	ND 2200	ND 370	ND 380	ND 5800	ND 730 J	ND 5200
2-Nitrophenol	ug/Kg	ND 400	ND 400	ND 2200	ND 370	ND 380	ND 5800	ND 730 J	ND 5200
2,4-Dimethylphenol	ug/Kg	ND 400	ND 400	ND 2200	ND 370	ND 380	ND 5800	ND 730 J	ND 5200
Bis(2-chloroethoxy)methane	ug/Kg	ND 400	ND 400	ND 2200	ND 370	ND 380	ND 5800	ND 730 J	ND 5200
2,4-Dichlorophenol 1,2,4-Trichlorobenzene	ug/Kg	ND 400 58 J	ND 400 ND 400	ND 2200 ND 2200	ND 370 ND 370	ND 380 ND 380	ND 5800 650 J	ND 730 J	ND 5200
Naphthalene	ug/Kg ug/Kg	58 J	ND 400 ND 400	ND 2200 340 J	ND 370	ND 380	4100 J	120 J 100 J	ND 5200 2600 J
4-Chloroaniline	ug/Kg	ND 400	ND 400	ND 2200	ND 370	ND 380	ND 5800	ND 730 J	ND 5200
Hexachlorobutadiene	ug/Kg	ND 400	ND 400	ND 2200	ND 370	ND 380	ND 5800	220 J	ND 5200
4-Chloro-3-methylphenol	ug/Kg	ND 400	ND 400	ND 2200	ND 370	ND 380	ND 5800	ND 730 J	ND 5200
2-Methylnaphthalene	ug/Kg	ND 400 ND 400	ND 400	ND 2200	ND 370	ND 380	ND 5800	120 J	ND 5200
Hexachlorocyclopentadiene 2,4,6-Trichlorophenol	ug/Kg ug/Kg	ND 400 ND 400	ND 400 ND 400	ND 2200 ND 2200	ND 370 ND 370	ND 380 ND 380	ND 5800 ND 5800	ND 730 J ND 730 J	ND 5200 ND 5200
2,4,5-Trichlorophenol	ug/Kg	ND 970	ND 970	ND 5200	ND 900	ND 910	ND 14000	ND 1800 J	ND 13000
2-Chloronaphthalene	ug/Kg	ND 400	ND 400	ND 2200	ND 370	ND 380	ND 5800	ND 730 J	ND 5200
2-Nitroaniline	ug/Kg	ND 800	ND 800	ND 4300	ND 740	ND 750	ND 11000	ND 1500 J	ND 10000
Dimethyl phthalate	ug/Kg	ND 400	ND 400	ND 2200	ND 370	ND 380	ND 5800	290 J	ND 5200
Acenaphthylene 2,6-Dinkrotoluene	ug/Kg	ND 400	ND 400	ND 2200 ND 2200	ND 370	ND 380	ND 5800	ND 730 J	ND 5200
3-Nitroaniline	ug/Kg ug/Kg	ND 400 ND 800	ND 400 ND 800	ND 4300 ND 4300	ND 370 ND 740	ND 380 ND 750	ND 5800 ND 11000	ND 730 J ND 1500 J	ND 5200 ND 10000
Acenaphthene	ug/Kg	ND 400	100 1	730 J	ND 740 ND 370	ND 380	620 J	ND 730 J	ND 10000 ND 5200
2,4-Dinitrophenol	ug/Kg	ND 800	ND 800	ND 4300	ND 740	ND 750	ND 11000	ND 1500 J	ND 10000
4-Nitrophenol	ug/Kg	ND 800	ND 800	ND 4300	ND 740	ND 750	ND 11000	ND 1500 J	ND 10000
Dibenzofuran	ug/Kg	ND 400	52 J	430 J	ND 370	ND 380	ND 5800	ND 730 J	ND 5200
2,4 Dinitrotoluene Diethyl phthalate	ug/Kg ug/Kg	ND 400 ND 400	ND 400 ND 400	ND 2200	ND 370	ND 380	ND 5800	ND 730 J	ND 5200
Diemiji pilulalate	ng/ ng	ND 400	ND 400	ND 2200	ND 370	ND 380	ND 5800	ND 730 J	ND 5200

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

Date Printed: May 12, 1999

Page 3 (c)

Time Printed: 2:17 pm

AUGUST 1998 - APRIL 1999

Sample Location:		SED-7	SED-8	SED-9	SED-10	SED-10	SED-11	SED-12	SED-13
Sample Depth:							-•		••
Sample Date:		08/05/1998	08/04/1998	08/06/1998	08/06/1998	08/06/1998	08/06/1998_	08/06/1998	08/06/1998
						Dupl.			
Parameters	Units					_ up			
TCL Semi-volatiles (Cont'd)									
Fluorene	ug/Kg	ND 400	97 J	770 J	ND 370	ND 380	690 J	ND 730 J	ND 5200
4-Chlorophenyl phenylether	ug/Kg	ND 400	ND 400	ND 2200	ND 370	ND 380	ND 5800	ND 730 J	ND 5200
4-Nitroaniline	ug/Kg	ND 800	ND 800	ND 4300	ND 740	ND 750	ND 11000	ND 1500 J	ND 10000
4,6-Dinitro-2-methylphenol N-nitrosodiphenylamine	ug/Kg	ND 800 ND 400	ND 800	ND 4300	ND 740	ND 750	ND 11000	ND 1500 J	ND 10000
4-Bromophenyl phenylether	ug/Kg ug/Kg	ND 400 ND 400	ND 400 ND 400	ND 2200 ND 2200	ND 370 ND 370	ND 380 ND 380	ND 5800 ND 5800	ND 730 J ND 730 J	ND 5200 ND 5200
Pentachiorophenot	ug/Kg	ND 800	ND 800	ND 4300	ND 740	ND 750	ND 11000	ND 1500 J	ND 10000
Phenanthrene	ug/Kg	ND 400	950	7500	54 J	ND 380	1700 J	530 J	1100 J
Anthracene	ug/Kg	ND 400	240 J	2500	ND 370	ND 380	ND 5800	74 J	ND 5200
Carbazole	ug/Kg	ND 400	130 J	1500 J	ND 370	ND 380	ND 5800	ND 730 J	ND 5200
Di-n-butyl phthalate	ug/Kg	ND 400	ND 400	ND 2200	ND 370	ND 380	ND 5800	140 5	ND 5200
Fluoranthene	ug/Kg	ND 400	1100	8900	110 J	ND 380	1300 J	430 J	670 J
Pyrene Butylbenzylphthalate	ug/Kg	ND 400 ND 400	1100	9300	100 J	42 J	1200 J	740 J	540 J
Benzo(a)anthracene	ug/Kg ug/Kg	ND 400 ND 400	ND 400 560	17000 4900	100 J 60 J	49 J ND 380	1000 J ND 5800	ND 730 J 97 J	ND 5200 ND 5200
3.3'-Dichlorobenzidine	ug/Kg	ND 400	ND 400	ND 2200	ND 370	ND 380	ND 5800	ND 730 J	ND 5200 ND 5200
Chrysene	ug/Kg	ND 400	530	4700	63 1	ND 380	800 1	280 j	ND 5200
Bis(2-ethylhexyl)phthalate	ug/Kg	ND 400	380 J	3400	320 B	250 J	29000	17000 J	8700
Di-n-octyl phthalate	ug/Kg	ND 400	ND 400	ND 2200	ND 370	ND 380	7200	1200 J	730 J
Benzo(b)fluoranthene	ug/Kg	ND 400	390 J	3600	45 J	ND 380	ND 5800	160 J	ND 5200
Benzo(k)fluoranthene	ug/Kg	ND 400	500	4200	52 J	ND 380	ND 5800	130 J	ND 5200
Benzo(a)pyrene Indeno(1,2,3-ed)pyrene	ug/Kg	ND 400 ND 400	490	4700	57 J	ND 380	ND 5800	90 J	ND 5200
Dibenz(a,h)anthracene	ug/Kg ug/Kg	ND 400 ND 400	330 J ND 400	3900 ND 2200	46 J ND 370	ND 380 ND 380	ND 5800 ND 5800	120 J ND 730 J	ND 5200 ND 5200
Benzo(g,h,i)perylene	ug/Kg	ND 400	360 J	4700	ND 370 52 J	ND 380	ND 5800	170 J	With Mark 15 Mill hit off what find it between which the consequence of the consequence o
1,2-Diphenyl-hydrazine	ug/Kg	ND 400	ND 400	ND 2200	ND 370	ND 380	ND 5800	ND 730 J	ND 5200 ND 5200
:Hexachlorobenzene	ug/Kg	ND 400	ND 400	ND 2200	ND 370	ND 380	37000	2600 J	1200 J
			**************************************	*********	314 J.U	00 Jou	27000	2000	1200 1
TAL Metals	 								
Aluminum	mg/Kg	17000	3200	2200	9300	9000	2800	6700 J	4200
Antimony	mg/Kg	0.74 JL	0.50 JL	1.5 JL	0.50 JL	0.65 JL	1.5 Л.	2.4 JL	โ.้เ มน
Arsenic	mg/Kg	6.2	2.2	1.2 B	3,4	2.9	0.83 B	2.6 B	1.1 B
Barium	mg/Kg	62	61	290	36	35	24	200 J	56
Beryllium Cadmium	mg/Kg	0.68	0.17	0.14	0.45	0.54	0.32	1.1 J	0.19
CAUTHUM	mg/Kg	ND 0.037	0.46	0.68	0.092	0.13	2.8	3,4 J	0.63

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION

Page 3 (d)

Date Printed: May 12, 1999

Time Printed: 2:17 pm

DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Sample Location: SED-7 SED-8 SED-9 SED-10 SED-10 SED-11 SED-12 SED-13 Sample Depth: Sample Date: 08/05/1998 08/04/1998 08/06/1998 08/06/1998 08/06/1998 08/06/1998 08/06/1998 08/06/1998 Dupl, **Parameters** Units TAL Metals (Cont'd) Calcium mg/Kg 160 390 780 1200 1300 3800 30000 J 1300 Chromium mg/Kg 26 I 5.4 1 46 J 14 J 14 J 28 J 79 1 26 1 Cobalt mg/Kg 6.8 5.2 2.8 4.5 4.3 2.0 8.2 J 2,2 Copper mg/Kg 9.2 JK 5.1 JK 78 JK 16 JK 40 Jk 63 JK 180 JK 25 JK Iron 24000 mg/Kg 5500 9700 12000 11000 5600 28000 J 5800 Lead 9.5 J mg/Kg 4.8 J .50 J 14 1 17) 40 J 130 J 18 J Magnesium 2500 mg/Kg 390 1300 1100 1100 1500 13000 J 1100 Manganese mg/Kg 120 JK 62 JK 100 JK 140 JK 130 JK 38 JK 260 JK 58 JK Mercury mg/Kg 3.0 J 140 J 6.3 J 5.1 J 10 J 61 J 75 J 5.3 J Nickel mg/Kg 13 5.9 18 9.9 12 29 110 J 20 Potassium 1500 mg/Kg 320 360 540 540 240 1200 J 410 Selenium mg/Kg 0.47 ND 0.24 0.48 0.36 ND 0.23 ND 0.36 0.91 J ND 0.34 Silver 1.0 mg/Kg 0.21 J 0.56 J 0.55 J 0.49 0.45 J 0.21 J 1,3 J Sodium mg/Kg 1900 280 36 B 51 57 840 1900 J 760 Thallium mg/Kg 0.35 ND 0.22 0.34 ND 0.20 ND 0.20 ND 0.33 ND 0.40 J ND 0.30 Vanadium mg/Kg 38 18 7.3 24 24 35 48] 25 Zinc mg/Kg 41 J 120 J 750 J 54 J 120 J 600 J 1900 J 240 J Methyl mercury ug/Kg General Chemistry Ammonia mg/Kg Sulfide mg/Kg Coarse gravel (19.0 mm) % Fine gravel (4.75 mm) % Coarse sand (2.00 mm) Medium sand (0.425 mm) % Fine sand (0.075 mm) Silts/clays (<0.075 mm) % Total organic carbon (TOC) mg/Kg

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 4 (a)

Date Printed: May 12, 1999

Time Printed: 2:17 pm

Sample Location: Sample Depth: Sample Date:		SED-14, 08/06/1998	A-34S 19-21 ft. 09/24/1998	C-21 01/13/1999	C-21 01/13/1999 Dupl.	C-21C 01/13/1999	C-22 01/25/1999	C-C20 01/26/1999	C-C23 01/25/1999
Parameters	<u>Units</u>				Dupi,				
TCL Volatiles									
Chloromethane Bromomethane	ug/Kg	ND 20 ND 20		ND 71. J	ND 67 J	ND 77 J	ND 20	ND 12	ND 42 J
Vinyt chloride	ug/Kg ug/Kg	ND 20 86	 	ND 71 J 50 J	ND 67 J	ND 77 J	ND 20	ND 12	ND 42 J
Chloroethane	ug/Kg	ND 20		30 J ND 71 J	ND 25 # ND 67 J	41 J ND 77 J	ND 20 ND 20	140	110 JK
Methylene chloride	ug/Kg			8 J	ND 07 1	21 J	ND 20 - ND 20	ND 12 ND 12	ND 42 J 12 B
Acetone	ug/Kg	ND 20	· · · · · · · · · · · · · · · · · · ·	170 J	190 J	460 J	44 K	ND 12	12 B 230 JK
Carbon disulfide	ug/Kg	ND 20		ND 71 J	ND 67 J	130 J	ND 20	ND 12	230 JA ND 42 J
1,1-Dichloroethene	ug/Kg	3 J		ND 71 J	ND 67. J	ND 77 J	ND 20	ND 12	ND 42 J
1,1-Dichloroethane 1,2-Dichloroethene (total)	ug/Kg	ND 20		ND 71 J	ND 67 J	ND 77 J	ND 20	ND 12	6 JK
2-Butanone (MEK)	ug/Kg	ND 20 ND 20		ND 71 J	ND 67 J	ND 77 J	ND 20	ND 12	ND 42 J
Chloroform	ug/Kg ug/Kg	ND 20 10 J		69 J ND 71 J	ND 67 1	140 J	ND 20	ND 12	ND 42 J
1,2-Dichloroethane	ug/Kg	ND 20		ND 71 J	ND 67 J ND 67 J	ND 77 J ND 77 J	ND 20 ND 20	7 J	21 JK
1,1,1-Trichloroethane	ug/Kg	ND 20	B-4	ND 71 J	ND 67 J	ND 77 J	ND 20 ND 20	ND 12 ND 12	ND 42 J
Carbon tetrachloride	ug/Kg	ND 20		ND 71 J	ND 67 J	ND 77 I	ND 20	ND 12	ND 42 J ND 42 J
Bromodichloromethane	ug/Kg	ND 20		ND 71 J	ND 67 J	ND 77 J	ND 20	ND 12	ND 42 J
1.2-Dichloropropane	ug/Kg	ND 20		ND 71 I	ND 67 J	ND 77 J	ND 20	ND 12	ND 42 I
cis-1,3-Dichloropropene Trichloroethene	ug/Kg	ND 20	 	ND 71 J	ND 67 J	ND 77 J	ND 20	ND 12	ND 42 J
Benzene	ug/Kg	2 J		ND 71 J	ND 67 I	ND 77 J	ND 20	ND 12	21 JK
Dibromochloromethane	ug/Kg ug/Kg	ND 20 ND 20		120 J	90 J	130 J	2800 J	230 J	200000 J
trans-1,3-Dichloropropene	ug/Kg	ND 20		ND 71 J ND 71 J	ND 67 J ND 67 J	ND 77 J	ND 20 J	ND 12	ND 210000 J
1,1,2-Trichtoroethane	ug/Kg	ND 20	 	ND 71 J	ND 67 J	ND 77 J ND 77 J	ND 20	ND 12	ND 42 J
Bromoform	ug/Kg	ND 20		ND 71 J	ND 67 J	ND 77 J	ND 20 J ND 20 J	ND 12 ND 12	ND 210000 J ND 210000 J
4-Methyl-2-pentanone (MIBK)	ug/Kg	ND 20		ND 71 J	ND 67. J	ND 77 J	ND 20 J	ND 12 ND 12	ND 210000 J
2-Hexanone	ug/Kg	ND 20		ND 71 J	ND 67 J	ND 77 J.	ND 20 J	ND 12	ND 210000 J
Tetrachloroethene	ug/Kg	20	**	ND 71 J	ND 67-1	ND 77 J	ND 20 J	· · · · · · · · · · · · · · · · · · ·	ND 210000 J
1,1,2,2-Tetrachloroethane Toluene	ug/Kg	ND 20	estelleseerreerreerre	ND 71 J	ND 67 J	ND 77 J	ND 20 J	ND 12	ND 210000 J
Chlorobenzene	ug/Kg	ND 20		11.1	ND 67 J	30000 J	11:K	ND 12	ND 210000 J
Ethylbenzene	ug/Kg ug/Kg	3 J ND 20	-	1300 J	660 J	130 ј	300000	1500	2100000 J
Styrene	ug/Kg	ND 20 ND 20	se acrossous selectroles established and established and an analysis of the selection of th	ND 71 J ND 71 J	ND 67 J	ND 77 J	ND 20 J	ND 12	ND 210000 J
Xylenes (total)	ug/Kg	ND 20	<u></u>	ND 71 J	ND 67 J ND 67 J	ND 77 J ND 77 J	ND 20 J	ND 12	ND 210000 J
TCL Semi-volatiles		on the second second second second second second second second second second second second second second second		**************************************	MANAGE TO SECOND	10 // 1	ND 20-J	ND 12	ND 210000 J
1 OD DOME TOTALIES									
Phenol	ug/Kg	ND 670		ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J

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05/10/99

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION

DELAWARE CITY, DELAWARE AUGUST 1998 - APRIL 1999 Page 4 (b)

Date Printed: May 12, 1999

Sample Location:		SED-14	A-34S	C-21	C-21	C-21C	C-22	C-C20	C-C23	
Sample Depth:			19-21 ft.							
Sample Date:		08/06/1998	09/24/1998	01/13/1999	01/13/1999	01/13/1999	01/25/1999	01/26/1999	01/25/1999	
•		00/00/12/0				01/13/1777	0112311333	01/20/1999	01/23/1999	
Parameters	II_ia.				Dupl.					
r arameters	Units									
TCL Semi-volatiles (Cont'd)										
Bis(2-chloroethyl)ether	ug/Kg	ND 200		ND 700 J	ND 680 J	ND 770 J	ND 94	ND 61	ND 210 J	20000 E 2000 E 2000 E 2000 E 2000 E 2000 E 2000 E 2000 E 2000 E 2000 E 2000 E 2000 E 2000 E 2000 E 2000 E 2000
2-Chlorophenol	ug/Kg	ND 670	ecintri dan manana dan manana da manana da manana da manana da manana da manana da manana da manana da manana d	ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	700 J	000000000000000000000000000000000000000
1,3-Dichlorobenzene 1,4-Dichlorobenzene	ug/Kg	ND 670		ND 2300 J	ND 2300 J	ND 2500 J	1200	270	7200 J	
1,2-Dichlorobenzene	ug/Kg ug/Kg	310 J ND 670	 	450 J ND 2300 J	260 J_	ND 2500 J	6200	1200	140000 J	da.uede.aueaeaeae
2-Methylphenol	ug/Kg	ND 670		ND 2300 J	ND 2300 J ND 2300 J	ND 2500 J ND 2500 J	550	920 ND 200	99000 J	
2,2'-Oxybis(1-chloropropane)	ug/Kg	ND 670		ND 2300 J	ND 2300 J	ND 2500 J	ND 310 ND 310	ND 200 ND 200	ND 690 J ND 690 J	ectionalment.
4-Methylphenol	ug/Kg	ND 670		ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200 ND 200	ND 690 1	
N-nitroso-di-n-propylamine	ug/Kg	ND 670		ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J	238060240254624
Hexachloroethane	ug/Kg	93 J	***	ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J	000000000000000000000000000000000000000
Nitrobenzene	ug/Kg	ND 670	-	ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J	
Isophorone	ug/Kg	ND 670	este incommunicación	ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J	ar a second a properties of
2-Nitrophenol 2,4-Dimethylphenol	ug/Kg	ND 670 ND 670		ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J	
Bis(2-chloroethoxy)methane	ug/Kg ug/Kg	ND 670	 	ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J	: 1946.25 46400 465 46
2,4-Dichlorophenol	ug/Kg	ND 670		ND 2300 J ND 2300 J	ND 2300 J ND 2300 J	ND 2500 J ND 2500 J	ND 310 ND 310	ND 200 ND 200	ND 690 J	
1,2,4-Trichlorobenzene	ug/Kg	140°J	-	■ ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200 41 3	ND 690 J 2800 J	56(21),836(,2),8(838)
Naphthalene	ug/Kg	130 J		ND 2300 J	ND 2300 J	ND 2500 J	33 J	ND 200	270 J	
4-Chloroaniline	ug/Kg	ND 670		ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J	
Hexachlorobutadiene	ug/Kg	ND 670	· van en onder management in en moone	ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J	Annual consistence di sesso
4-Chloro-3-methylphenol 2-Methylnaphthalene	ug/Kg	ND 670	-	ND 2300 I	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J	
Hexachlorocyclopentadiene	ug/Kg	300 J ND 670	=	ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J	9000000.0000000000
2,4,6-Trichlorophenol	ug/Kg ug/Kg	ND 670	,,.,.,.,.,.,.,.,.,.,	ND 2300 J ND 2300 J	ND 2300 J ND 2300 J	ND 2500 J ND 2500 J	ND 310	ND 200	ND 690 J	
2,4,5-Trichlorophenol	ug/Kg	ND 1600	 	ND 5500 J	ND 5400 J	ND 6100 J	ND 310 ND 750	ND 200 ND 480	ND 690 J ND 1700 J	ison-munancananatana
2-Chloronaphthalene	ug/Kg	ND 670	(************************	ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J	
2-Nitroaniline	ug/Kg	ND 1300	 	ND 4500 J	ND 4400 J	ND 5000 J	ND 610	ND 400	ND 1400 J	90000000000000000000000000000000000000
Dimethyl phthalate	ug/Kg	140 J	==	ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J	- anneasonmenter
Acenaphthylene	ug/Kg	ND 670		ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J	
2,6-Dinitrotoluene 3-Nitroaniline	ug/Kg	ND 670		ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J	escar proved a con-
Acenaphthene	ug/Kg	ND 1300	-	ND 4500 I	ND 4400 J	ND 5000 J	ND 610	ND 400	ND 1400 J	
2,4-Dinitrophenol	ug/Kg ug/Kg	74 J ND 1300	••	ND 2300 J ND 4500 J	ND 2300 J ND 4400 J	ND 2500 J	ND 310	ND 200	ND 690 J	ånansueres sessinder
4-Nitrophenol	ug/Kg	ND 1300		ND 4500 J	ND 4400 J ND 4400 J	ND 5000 J ND 5000 J	ND 610	ND 400	ND 1400 J	
Dibenzofuran	ug/Kg	ND 670		ND 2300 J	ND 2300 J	ND 2500 J	ND 610 ND 310	ND 400 ND 200	ND 1400 J ND 690 J	2000000000000
2,4-Dinitrotoluene	ug/Kg	ND 670	wara na yinaani aa qoo ahaa Waababa ***	ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J	
Diethyl phthalate	ug/Kg	ND 670		ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J	1000000 1000 1000 1000000 1000 1000

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

Time Printed: 2:17 pm

Page 4 (c)

Date Printed: May 12, 1999

AUGUST 1998 - APRIL 199

Sample Location:		SED-14	A-34S	C-21	C-21	C-21C	C-22	C-C20	C-Ç23
Sample Depth:			19-21 ft.					•-	
Sample Date:		08/06/1998	09/24/1998	01/13/1999	01/13/1999	01/13/1999	01/25/1999	01/26/1999	01/25/1999
					Dupl.				
Parameters	Units				Dup.ii				
	<u> </u>								
TCL Semi-volatiles (Cont'd)					6.				
Fluorene	ug/Kg	120 J		ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J
4-Chlorophenyl phenylether	ug/Kg	ND 670		ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J
4-Nitroaniline 4,6-Dinitro-2-methylphenol	ug/Kg	ND 1300 ND 1300	ananii waxaa Ta araa	ND 4500 J	ND 4400 J	ND 5000 J	ND 610	ND 400	ND 1400 J
N-nitrosodiphenylamine	ug/Kg ug/Kg	ND 670		ND 4500 J ND 2300 J	ND 4400 J ND 2300 J	ND 5000 J ND 2500 J	ND 610	ND 400	ND 1400 J
4-Bromophenyl phenylether	ug/Kg	ND 670		ND 2300 J	ND 2300 J	ND 2500 J	ND 310 ND 310	ND 200 ND 200	ND 690 J ND 690 J
Pentachlorophenol	ug/Kg	ND 1300	**************************************	ND 4500 J	ND 4400 J	ND 5000 J	ND 610	ND 400	ND 1400 J
Phenanthrene	ug/Kg	550 J		ND 2300 J	ND 2300 1	ND 2500 J	ND 310	ND 200	ND 690 J
Anthracene	ug/Kg	96 J		ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J
Carbazole	ug/Kg	ND 670		ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J
Di-n-butyl phthalate	ug/Kg	ND 670		ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J
Fluoranthene Pyrene	ug/Kg	720	-	ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 I
Butylbenzylphthalate	ug/Kg ug/Kg	980 ND 670	 	ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J
Benzo(a)anthracene	ug/Kg	ND 070 180 J		ND 2300 J ND 2300 J	ND 2300 J ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 1
3,3'-Dichlorobenzidine	ug/Kg	ND 670		ND 2300 J	ND 2300 J	ND 2500 J ND 2500 J	ND 310 ND 310	ND 200 ND 200	ND 690 J ND 690 J
Chrysene	ug/Kg	_ 550 J	en experimenta en en en experimenta de la constantida de desde de la constantida de la constantida de la const	ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J ND 690 J
Bis(2-ethylhexyt)phthalate	ug/Kg	11000	 	340.1	ND 2300 J	1100 J	ND 310	ND 200	ND 690 J
Di-n-octyl phthalate	ug/Kg	420 J		ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J
Benzo(b)fluoranthene	ug/Kg	340 J		ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J
Benzo(k)fluoranthene	ug/Kg	270 J	<u></u>	ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J
Benzo(a)pyrene Indeno(1,2,3-cd)pyrene	ug/Kg	180 J		ND 2300)	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J
Dibenz(a,h)anthracene	ug/Kg ug/Kg	290 J ND 670	 	ND 2300 . J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J
Benzo(g,h,i)perylene	ug/Kg	440 J		ND 2300 J ND 2300 J	ND 2300 J ND 2300 J	ND 2500 J ND 2500 J	ND 310	ND 200	ND 690 J
1,2-Diphenyl-hydrazine	ug/Kg	ND 670		ND 2300 J	ND 2300 J	ND 2500 J	ND 310 ND 310	ND 200 ND 200	ND 690 J ND 690 J
	,	and the same and an artist of the same and t		CONTRACTOR CONTRACTOR			**************************************		ND 070 1
Hexachlorobenzene	ug/Kg	1100		ND 2300 J	ND 2300 J	ND 2500 J	ND 310	ND 200	ND 690 J
TAL Metals									
Aluminum		osanoongoogaani rusu waxairee ca	egyegenik kanadan ananak ar aras	dástá sagái agag gabinnasan casta inne	consequences discover minimum venerum	estosocialesticour no numerio en e		derblevildere var en en en en en en en	totalistational and all the second and the
Atuminum Antimony	mg/Kg	16000 J		13000 J	17000 1	6500)	3600 J	12000 J	28000 J
Anumony	mg/Kg mg/Kg	3.5 JL 2.9 J	 	ND 2.0 JL	ND 2.0 JL	ND 2.2 JL	ND 0.45 L	ND 0.35 L	ND 1.2 JL
Barium	mg/Kg	2.9 J 160 J		3.2 J 87 J	5.0 J	2.0 J	3.1	3,5	19 J
Beryllium	mg/Kg	0.79 I		0.60 J	110 J 1.1 J	77 J 0.66 J	23	42	100 J
Cadmium _	mg/Kg	6.8 J		ND 0.14 J	ND 0.14 J	0.66 J ND 0.15 J	0.37 K ND 0.078	0.49 K ND 0.060	1,2 J ND 0,21 J

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION

Page 4 (d)

Date Printed: May 12, 1999

Time Printed: 2:17 pm

OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Sample Location: SED-14 A-34S C-21 C-21 C-21C C-22 C-C20 C-C23 19-21 ft. Sample Depth: 01/13/1999 01/13/1999 Sample Date: 08/06/1998 09/24/1998 01/13/1999 01/25/1999 01/26/1999 01/25/1999 Dupl. **Parameters** Units TAL Metals (Cont'd) 4500 J 3400 Calcium mg/Kg 3000 J 3400 J 760 J 270 J 3400 J 110 J Chromium mg/Kg 33 J 39 J 16 J 8.7 J 15 J 62 J Cobalt mg/Kg 8.4 J 3.6 J 4.5 J 3.1 J 4 1 4.8 12 J Copper 60 JK 6.6 J 8.8 J 5.1 J 4.3 6.4 13 J mg/Kg Iron mg/Kg 25000 J 8800 J t 00001 5400 I 3500 15000 36000 J 7.0 J Lead mg/Kg 86 J 9.3 J 3.5 J 4.6 6.2 16 J Magnesium 6400 J 2900 J 3400 J 1700 J 680 J 1300 mg/Kg 6000 J 240 JK 250 J Manganese 340 J mg/Kg 340 J 130 120 190 J 0.35 J Mercury mg/Kg 78 1 ND 0.046 1.1 7 ND 0.29 J 1.9 K ND 0.052 1.8 JK Nickel mg/Kg 69 J 13 J 17 12 J 24 J 6.0 8.1 Potassium 1900 J 640 7900 J 2200 1 720 J 660 3600 J mg/Kg ND 0.40 Selenium mg/Kg 2.7 J 2.6 J ND 1.8 J 1.0 B 0.49 B 2.7 B Silver 1.4] ND 0.41 JL ND 0.41 JL ND 0.45 JL 0.62 L mg/Kg 0.11 L 1.7 JL Sodium 1000 2600 J 2600 J 2500 590 3000 J mg/Kg 2500 J Thallium 0,46 1 ND 1.3 J mg/Kg ID 1.3 J ND 1.4 I D 0.19 D 0.14 ND 0.50 J Vanadium mg/Kg 41 J 25 J 37 J 16 J 10 26 59 J Zinc 1600 J 26 J 44 J 13 J 30 mg/Kg 23 70 J Methyl mercury ug/Kg 6.4 J 3.6 J 3.6 J 0.009 5.2 6.8 J General Chemistry mg/Kg Ammonia 120 J 160 J ND 6.0 100 J 34 36 J Sulfide mg/Kg ND 110 JL 160 JL 1000 JL ND 25 ND 19 ND 66 JL Coarse gravel (19,0 mm) 0.00 J 0.00 J 0.00 J 0.00 0.00 0.00 Fine gravel (4.75 mm) % 5.2 J 0.00 0.00 5.4 J 1.0 J 0.00 Coarse sand (2.00 mm) 34 J 21 J 27 J 10 1.6 2.8 J Medium sand (0,425 mm) % 36 J 66 J 43 J 51 43 44 J Fine sand (0,075 mm) 16 J 11 J 20 J 31 33 42 1 Silts/clays (<0.075 mm) % 5.3 J 0.4 J 1.3 J 7.7 23 12 Total organic carbon (TOC) 250000 J 160000 J 330000 J 44000 1000 mg/Kg 93000 J

AUGUST 1998 - APRIL 1999

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

Page 5 (a)

Date Printed: May 12, 1999

Sample Location:		C-C24	C-C25	S-C22	S-C24	SB-10	SB-11	SB-12	SB-13
Sample Depth:				-		2-4 ft.	6-8 ft.	12-14 ft.	0-2 ft.
Sample Date:	1	01/26/1999	01/25/1999	01/25/1999	01/26/1999	08/12/1998	08/13/1998	08/13/1998	08/18/1998
•									
Parameters	<u>Units</u>								
TCL Volatiles	 								
Chloromethane	ug/Kg	ND 17 J	ND 53 J	ND 20 J	ND 25	ND 11	ND 11	ND 12	ND 12
Bromomethane	ug/Kg	ND 17 J	ND 53 J	ND 20 J	ND 25	ND II	ND 11	ND 12	ND 12
Vinyl chloride Chloroethane	ug/Kg ug/Kg	ND 17 J ND 17 J	ND 53 J ND 53 J	ND 20 J ND 20 J	ND 25 ND 25	ND 11 ND 11	ND 11 ND 11	ND 12 ND 12	ND 12 ND 12
Methylene chloride	ug/Kg	ND 17 J	ND 53 J	4 B	ND 25	ND 11 2 B	1 B	ND 12 2 B	ND 12 ND 12
Acetone	ug/Kg	30 J	160 J	4i J	47	41 B	24 B	30 B	13 B
Carbon disulfide	ug/Kg	ND 17 J	ND 53 J	ND 20 J	ND 25	ND 11	ND 11	ND 12	ND 12
i ,1-Dichloroethene	ug/Kg	ND 17-1	ND 53 J	ND 20 J	ND 25	ND II	ND 11	ND 12	ND 12
1,1-Dichloroethane 1,2-Dichloroethene (total)	ug/Kg	ND 17 J	ND 53 J	ND 20 J	ND 25	ND 11	ND 11	ND 12	ND 12
2-Butanone (MEK)	ug/Kg ug/Kg	ND 17 J ND 17 J	ND 53 J ND 53 J	ND 20 J ND 20 J	ND 25 ND 25	ND 11 ND 11	ND 11 ND 11	ND 12 ND 12	ND 12 ND 12
Chloroform	ug/Kg	ND 17 1	ND 53 J	ND 20 J	ND 25	ND II	II DN	ND 12 ND 12	ND 12 ND 12
1,2-Dichloroethane	ug/Kg	ND 17 J	ND 53 J	ND 20 J	ND 25	ND 11	ND 11	ND 12	ND 12
1,1,1-Trichloroethane	ug/Kg	ND 17 J	ND 53 J	ND 20 J	ND 25	ND 11	ND 11	ND 12	ND 12
Carbon tetrachloride	ug/Kg	ND 17 J	ND 53 J	ND 20 J	ND 25	ND 11	ND 11	ND 12	ND 12
Bromodichloromethane 1,2-Dichloropropane	ug/Kg	ND 17 J	ND 53 J	ND 20 J	ND 25	ND 11	ND 11	ND 12	ND 12
cis-1,3-Dichloropropene	ug/Kg ug/Kg	ND 17 J ND 17 J	ND 53 J ND 53 J	ND 20 J ND 20 J	ND 25 ND 25	ND 11 ND 11	ND 11 ND 11	ND 12	ND 12
Trichloroethene	ug/Kg	ND 17 J	ND 53 J	ND 20 J	ND 25	ND 11	ND 11	ND 12 ND 12	ND 12 ND 12
Benzene	ug/Kg	7500.1	97 J	280 1	120	ND II	ND 11	340 K	4.3
Dibromochloromethane	ug/Kg	ND 17 J	ND 53 J	ND 20 J	ND 25	ND 11	ND 11	ND 12	ND 12
trans-1,3-Dichloropropene	ug/Kg	ND 17-J	ND 53 J	ND 20 J	ND 25	ND 11	ND 11	ND 12	ND 12
1,1,2-Trichloroethane Bromoform	ug/Kg	ND 17 J	ND 53 J	ND 20 J	ND 25	ND 11	ND 11	ND 12	ND 12
4-Methyl-2-pentanone (MIBK)	ug/Kg ug/Kg	ND 17 J ND 17 J	ND 53 J ND 53 J	ND 20 J ND 20 J	ND 25 ND 25	ND 11 ND 11	ND 11 ND 11	ND 12 ND 12	ND 12
2-Hexanone	ug/Kg	ND 17 J	ND 53 J	ND 20 J	ND 25	ND II	ND II	ND 12 ND 12	ND 12 ND 12
Tetrachloroethene	ug/Kg	ND 17 J	21 J	ND 20 J	ND 25	13 B	6 B	17 B	5 B
1,1,2,2-Tetrachloroethane	ug/Kg	ND 17 J	ND 53 J	ND 20 J	ND 25	ND II	ND 11	ND 12	ND 12
Toluene	ug/Kg	9 J	ND 53 J	ND 20 J	ND 25	ND 11	ND 11	2 K	ND 12
Chlorobenzene Ethylbenzene	ug/Kg	890 J	21 J	130000 J	480	ND 11	ND 11	26000	120
Styrene	ug/Kg ug/Kg	ND 17 J ND 17 J	ND 53 J ND 53 J	ND 20 J ND 20 J	ND 25	ND 11	ND 11	ND 12	ND 12
Xylenes (total)	ug/Kg	ND 17 J	15 J	ND 20 J	ND 25 ND 25	ND 11 ND 11	ND 11 ND 11	ND 12 ND 12	ND 12 ND 12
		110 11 3	13 3	110 20 1	1410 23	140 11	140 11	ND 12	ND 12
TCL Semi-volatiles									
A CONTRACTOR CONTRACTO	M. en antenede en contract 222000 (concreto	ski sta sa sa sa sa sa sa sa sa sa sa sa sa sa	aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa	tootoolooisetentee van maan van	unannannannann kan kan arasara	eline education en la victoria de la company	AAAAAA IAAAAA AAAA AAAA		
Phenol	ug/Kg	ND 270-J	ND 850 1	ND 340 J	ND 410	ND 370	ND 380	ND 400	ND 390

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

Page 5 (b)

Date Printed: May 12, 1999

Time Printed: 2:17 pm

AUGUST 1998 - APRIL 1999

C-C24 C-C25 S-C22 S-C24 **SB-10** SB-11 SB-12 SB-13 Sample Location: 6-8 ft. 12-14 ft. 0-2 ft. Sample Depth: 2-4 ft. 01/25/1999 01/26/1999 08/12/1998 08/13/1998 08/13/1998 08/18/1998 Sample Date: 01/26/1999 01/25/1999 Units **Parameters** TCL Semi-volatiles (Cont'd) ug/Kg ND 83 J ND 260 J ND 100 J ND 130 ND 110 ND 110 ND 120 ND 120 Bis(2-chloroethyl)ether ND 410 ND 370 360 J ND 390 ND 850 J ND 340 J ND 380 2-Chlorophenal ug/Kg ND 270 J 1.3-Dichlorobenzene ug/Kg ND 270 J ND 850 J 2000 J 790 ND 370 ND 380 4800 2900 1.4-Dichlorobenzene ug/Kg ND 270 1 85 J 48000 J 5500 ND 370 ND 380 61000 45000 1,2-Dichlorobenzene ND 270 J 18000 J 690 ND 370 ND 380 52000 21000 J ND 850 J ug/Kg ND 400 2-Methylphenol ug/Kg ND 270 J ND 850 J ND 340 J ND 410 ND 370 ND 380 ND 390 2,2'-Oxybis(1-chloropropane) ND 270 ND 340 J ND 410 ND 370 ND 380 ND 400 ND 390 ug/Kg ND 850 J 4-Methylphenol ND 270 J ND 850 J ND 340 J ND 410 ND 370 ND 380 ND 400 ND 390 ug/Kg ND 400 N-nitroso-di-n-propylamine ND 270 J ND 850 J ND 340 J ND 410 ND 370 ND 380 ND 390 ug/Kg Hexachloroethane ND 270 J ND 340 J ND 410 ND 370 ND 380 ND 400 ND 390 ug/Kg ND 850 J Nitrobenzene ug/Kg ND 270 J ND 850 J ND 340 J ND 410 ND 370 ND 380 ND 400 100 J ND 410 ND 380 ND 400 ND 390 Isophorone ug/Kg ND 270 J ND 850 J ND 340 J ... ND 370 2-Nitrophenol ug/Kg ND 270 J ND 850 J ND 340 J ND 410 ND 370 ND 380 ND 400 ND 390 2.4-Dimethylphenol ND 340 J ND 410 ND 380 ND 400 ND 390 ug/Kg ND 270 J ND 850 J ND 370 Bis(2-chloroethoxy)methane ug/Kg ND 270 J ND 850 J ND 340 J ND 410 ND 370 ND 380 ND 400 ND 390 2.4-Dichlorophenol ND 340 I ND 410 ND 370 ND 380 260 J ND 390 ug/Kg ND 270 J ND 850 1 1.2.4-Trichlorobenzene ug/Kg ND 270 J ND 850 J ND 340 J 120 J ND 370 ND 380 14000 J 130000 Naphthalene ND 850 J 64] ND 370 ND 380 ND 390 81 J 58 J 140 J ug/Kg ND 270 J 4-Chloroaniline ug/Kg ND 850 J ND 340 ND 410 ND 370 ND 380 ND 400 ND 390 Hexachlorobutadiene ND 270 J ND 850 J ND 340 J ND 410 ND 370 ND 380 ND 400 ND 390 ug/Kg 4-Chloro-3-methylphenol ND 270 I ND 850 J ND 340 J ND 410 ND 370 ND 380 ND 400 ND 390 ug/Kg 2-Methylnaphthalene ND 340 J ND 410 ND 400 ug/Kg 31 J ND 850 J ND 370 ND 380 ND 390 Hexachlorocyclopentadiene ND 270 J ND 850 J ND 340 J ND 410 ND 370 ND 380 ND 400 ND 390 ug/Kg 2,4,6-Trichlorophenol ND 850 J ND 400 ND 270 J ND 340 J ND 410 ND 370 ND 380 ND 390 ug/Kg 2,4,5-Trichlorophenol ND 2100 J ND 960 ug/Kg ND 660 J ND 810 J ND 1000 ND 880 ND 910 ND 940 2-Chloronaphthalene ug/Kg ND 270 J ND 850 J ND 340 J ND 410 ND 370 ND 380 ND 400 ND 390 2-Nitroaniline ND 540 J ND 1700 J ND 790 ug/Kg ND 660 J ND 820 ND 720 ND 740 ND 770 Dimethyl phthalate ug/Kg ND 270 J ND 850 J ND 340 J ND 410 ND 370 ND 380 ND 400 ND 390 Acenaphthylene ND 270 J ND 850 J ND 340 J ND 370 ND 380 ND 400 ug/Kg ND 410 ND 390 2,6-Dinitrotoluene ND 270 J ND 850 J ND 340 J ND 410 ND 370 ND 380 ND 400 ND 390 ug/Kg 3-Nitroaniline ND 540 J ND 1700 J ND 660 J ND 720 ND 790 ND 820 ND 740 ND 770 ug/Kg Acenaphthene ND 270 J ND 850 J ND 340 J ND 410 ug/Kg ND 370 ND 380 ND 400 ND 390 2.4-Dinitrophenol ug/Kg ND 540 J ND 1700 J ND 660 J ND 820 ND 720 ND 740 ND 790 ND 770 4-Nitrophenol ug/Kg ND 540 J ND 1700 J ND 660 J ND 820 ND 720 ND 740 ND 790 ND 770 ND 270 J Dibenzofuran ND 850 J ND 340 J ND 410 ND 380 ND 400 ND 390 ND 370 ug/Kg ND 370 ND 380 2.4-Dinitrotoluene ND 270 J ND 850 J ND 340 J ND 410 ND 400 ND 390 ug/Kg Diethyl phthalate ug/Kg ND 270 J ND 850 J ND 340 J ND 410 ND 370 ND 380 ND 400 ND 390

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION

Page 5 (c)

Date Printed: May 12, 1999

Time Printed: 2:18 pm

OCCIDENTAL CHEMICAL CORPORATION **DELAWARE CITY, DELAWARE**

AUGUST	1998 -	APRIL	1999	

Sample Location:		C-C24	C-C25	S-C22	S-C24	SB-10	SB-11	SB-12	SB-13
Sample Depth:	ļ.					2-4 ft.	6-8 ft.	12-14 ft.	0-2 ft.
Sample Date:	F	01/26/1999	01/25/1999	01/25/1999	01/26/1999	08/12/1998	08/13/1998	08/13/1998	08/18/19 <u>98</u> _
-	İ								
Parameters	Units								
TCL Semi-volatiles (Cont'd)									
Fluorene	ug/Kg	ND 270 J	ND 850 J	ND 340. J	ND 410	ND 370	ND 380	ND 400	ND 390
4-Chlorophenyl phenylether	ug/Kg	ND 270 J	ND 850 J	ND 340 J	ND 410	ND 370	ND 380	ND 400	ND 390
4-Nitroaniling	ug/Kg	ND 540 J	ND 1700 J	ND 660 J	ND 820	ND 720	ND 740	ND 790	ND 770
4,6-Dinitro-2-methylphenol	ug/Kg	ND 540 J	ND 1700 J	ND 660 J	ND 820	ND 720	ND 740	ND 790	ND 770
N-nitrosodiphenylamine 4-Bromophenyl phenylether	ug/Kg ug/Kg	ND 270 J ND 270 J	ND 850 J ND 850 J	ND 340 J ND 340 J	ND 410 ND 410	ND 370 ND 370	ND 380 ND 380	ND 400 ND 400	ND 390 ND 390
Pentachiorophenol	ug/Kg	ND 540 J	ND 1760 J	ND 660 J	ND 410 ND 820	ND 720	ND 740	ND 790	ND 770
Phenanthrene	ug/Kg	53 J	ND 850 J	ND 340 J	72 J	59 J	ND 380	ND 400	ND 390
Anthracene	ug/Kg	ND 270 J	ND 850 J	ND 340 J	ND 410	ND 370	ND 380	ND 400	ND 390
Carbazole	ug/Kg	ND 270 J	ND 850 J	ND 340 J	ND 410	ND 370	ND 380	ND 400	ND 390
Di-n-butyl phthalate	ug/Kg	ND 270 J	ND 850 J	ND 340 J	ND 410	ND 370	ND 380	ND 400	ND 390
Fluoranthene	ug/Kg	81 J	ND 850 J	ND 340 J	120 J	38 J	ND 380	ND 400	ND 390
Pyrene	ug/Kg	67]	ND 850 J	ND 340 J	110 J	45 J	ND 380	ND 400	ND 390
Burylbenzylphthalate Benzo(a)anihracene	ug/Kg	ND 270 J 48 J	ND 850 J ND 850 J	ND 340 J ND 340 J	ND 410 67 J	ND 370 ND 370	ND 380 ND 380	ND 400 ND 400	ND 390 ND 390
3.3'-Dichlorobenzidine	ug/Kg ug/Kg	ND 270 J	ND 850 J	ND 340 J	ND 410	ND 370	ND 380	ND 400	ND 390
Chrysene	ug/ Kg	61 J	ND 850 J	ND 340 J	82 J	41 J	ND 380	ND 400	ND 390
Bis(2-ethylhexyl)phthalate	ug/Kg	ND 270 J	ND 850 J	36 B	230 B	ND 370	170 J	2100	ND 390
Di-n-octyl phthalate	ug/Kg	ND 270 J	ND 850 J	ND 340 J	100 J	ND 370	ND 380	ND 400	ND 390
Benzo(b)fluoranthene	ug/Kg	44 J	ND 850 J	ND 340 J	92 J	ND 370	ND 380	ND 400	ND 390
Benzo(k)fluoranthene	ug/Kg	60 I	ND 850 J	ND 340 J	83 J	ND 370	ND 380	ND 400	ND 390
Benzo(a)pyrene Indeno(1,2,3-ed)pyrene	ug/Kg	66 J 32 J	ND 850 J ND 850 J	ND 340 J ND 340 J	81 J 50 J	ND 370	ND 380	ND 400	ND 390 ND 390
Dibenz(a,h)anthracene	ug/Kg ug/Kg	34 1 ND 270 J	ND 850 J	ND 340 J ND 340 J	30 J ND 410	ND 370 ND 370	ND 380 ND 380	ND 400 ND 400	ND 390 ND 390
Benzo(g,h,i)perylene	ug/Kg	39 1	ND 850 J	ND 340 J	62 J	ND 370	ND 380	ND 400 ND 400	ND 390
1,2-Diphenyl-hydrazine	ug/Kg	ND 270 J	ND 850 J	ND 340 J	ND 410	ND 370	ND 380	ND 400	ND 390
	gan kanan da kanan kanan da ka	LITE AND IN						ta ola hasabesta <u>eta anta ar ar ar</u>	estáncia e alta constato de la compansión de la compansió
Hexachlorobenzene	ug/Kg	ND 270 J	ND 850 J	ND 340 J	ND 410	ND 370	ND 380	ND 400	92 J
TAL Metals									
Aluminum	mg/Kg	7400 J	23000 J	23000 J	24000 Ј	10000	7800	11000	18000
Antimony	mg/Kg	ND 0.47 JL	ND 1.5 JL		ND 0.72 L	0.6 L	ND 310 L	0.44 L	0.57 L
Arsenic	mg/Kg	9.9 J	33 J	13 J	23	5.8	2.3	5.9	5.4
Barium	mg/Kg	28 J	130 J	96 J	130	93	22	44	52
Beryllium Cadmium	mg/Kg	0,66 JK	2.9 JK		1.5 K	0.8	0.33	0.59	0.73
Samillilli	mg/Kg	ND 0.082 J	ND 0.26 J	0.48 J	0.41	0.38	0.1	0.2	0.36

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION

DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 5 (d)
Date Printed: May 12, 1999

Sample Location: Sample Depth: Sample Date:) - -	C-C24 01/26/1999	C-C25 01/25/1999	S-C22 01/25/1999	S-C24 01/26/1999	SB-10 2-4 ft. 08/12/1998	SB-11 6-8 ft. _08/13/1998	SB-12 12-14 ft. 08/13/1998	SB-13 0-2 ft. 08/18/1998
Parameters .	<u>Units</u>								
TAL Metals (Cont'd)									
Calcium	mg/Kg	1600 J	6400 J	2000 J	2300 ј	18000	600	460	390
Chromium	mg/Kg	17 J	54 J	75 1	100 J	30	12	18	26
Cobalt Copper	mg/Kg mg/Kg	14 J 4.8 J	28 J 16 J	16 J 32 J	20 50	7.5 26	4.3 5.5	8.5	7.3 10
Iron	mg/Kg	15000 J	35000 J	25000 J	37000	18000	10000	11 16000	22000
Lead	mg/Kg	4.6 J	17 J	48 J	69	69	4.4	16	8.1
Magnesium	mg/Kg	2000 J	4800 J	5500 J	5400 J	7300	1200	1300	2700
Manganese Mercury	mg/Kg mg/Kg	88 J ND 0.078 J	1100 J ND 0.24 J	410 J 3.1 JK	800 24 K	770 0,082 J	110 2.7 J	450	190 ND 48 J
Nickel	mg/Kg	15 j	ND 0.24 7 42 J	32 J	51 °	0.082 J 41	2.7 S 5.7	0.38 J 12	!u\0500\00000000000000000000000000000000
Potassium	mg/Kg	1600 J	1900 J	3600 J	3800	2700	1700	1200	12 1500
Selenium	mg/Kg	1.2 B	4.4 B	2.1 B	2.3 B	1.1	0.34 K	0.84 K	0.83 K
Silver	mg/Kg	0.77 JL	1.5 JL	1.2 JL	1.8 L	ND 60	ND 60	ND 60	ND 60
Sodium Thailium	mg/Kg	6400 J ND 0.20 J	4600 J ND 0.62 J	2800 J ND 0.24 J	5400 ND 0.10	930	840	920	440
Vanadium	mg/Kg mg/Kg	ND 0.20 J	ND 0.62 J 62 J	ND 0.24 J 53 J	ND 0.30 120	ND 180	ND 180	ND 180	ND 180 42
Zinc	mg/Kg	38 J	150 J	300 J	290	34 88	20 15	36 41	
Methyl mercury	ug/Kg	7.7 J	1.0 J		6.4	-	-	·	33
General Chemistry				,					***************************************
General Chemistry									
Ammonia	mg/Kg	33 J	80 J	48 J	44				
Sulfide	mg/Kg	ND 26 JL	ND 82 JL	ND 32 JL	ND 40	_	-	-	-
Coarse gravel (19.0 mm) Fine gravel (4.75 mm)	% %	0.00 J	t 00.0	t 00,0	0.00				
Coarse sand (2.00 mm)	%	12 J	14 J	0.60 J 11 J	0.00 8.4				
Medium sand (0.425 mm)	%	54 J	52 j	Ŝi Ĵ	44	· · · · · · · · · · · · · · · · · · ·			
Fine sand (0.075 mm)	% %	28 J	25 J	26 J	38	en en en en en en en en en en en en en e		en en en en en en en en en en en en en e	**************************************
Silts/clays (<0.075 mm)		6.4 J	9,1 J	12.3	9.3	-	-	-	-
Total organic carbon (TOC)	mg/Kg	35000 J	320000 J	44000 J	49000	13000	1200	10000	2300
}									

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - BCPA FACILITY INVESTIGATION

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 6 (a)

Date Printed: May 12, 1999

Time Printed: 2:18 pm

Sample Location:		SS-11	SS-11A	SS-12	SS-12	SS-12A	SS-13	SS-14	SS-15
Sample Depth:					••	-			
Sample Date:		08/05/1998	08/05/1998	08/05/1998	08/05/1998	08/05/1998	08/04/1998	_08/04/1998	08/04/1998
·	1				Dupi.				
Parameters	<u>Units</u>				Dup				
	91113								
TCL Volatiles									
Chloromethane	ug/Kg	ND 10	II DN	ND 10	ND 10	ND 13	ND 10	ND 11	ND 12
Bromomethane	ug/Kg	ND 10	ND 11	ND 10	ND 10	ND 13	ND 10	ND 11	ND 12
Vinyl chtoride Chloroethane	ug/Kg	ND 10 ND 10	ND 11 ND 11	ND 10 ND 10	4 1	6200	ND 10	ND II	ND 12
Methylene chloride	ug/Kg ug/Kg	3 B	3 B	עא 3 B	ND 10 3 B	ND 13 8 B	ND 10 5 B	ND 11 2 B	ND 12 3.B
Acetone	ug/Kg	ND 10	ND II	4 B	4 B	11 B	5 B	ND 11	ND 12
Carbon disulfide	ug/Kg	1.1	ND 11	ND 10	ND 10	ND 13	2 J.	ND 11	ND 12
1,1-Dichloroethene	ug/Kg	ND 10	ND 11	ND 10	ND 10	ND 13	ND 10	ND 11	ND 12
1,1-Dichloroethane	ug/Kg	ND 10	ND II	ND 10	ND 10	ND 13	ND 10	ND II	ND 12
1,2-Dichloroethene (total) 2-Butanone (MEK)	ug/Kg ug/Kg	ND 10 ND 10	ND 11 ND 11	ND 10 ND 10	ND 10	ND 13	ND 10	ND 11	ND 12
Chloroform	ug/Kg	ND 10	ND 11	ND 10	ND 10 ND 10	ND 13 83	ND 10 ND 10	ND 11 ND 11	ND 12 ND 12
1,2-Dichloroethane	ug/Kg	ND IO	ND II	ND IO	ND 10	2 j	ND 10	ND II	ND 12 ND 12
1,1,1-Trichloroethane	ug/Kg	ND 10	ND 11	ND 10	ND 10	ND 13	ND 10	ND 11	ND 12
Carbon tetrachloride	ug/Kg	ND 10	ND H	ND 10	ND 10	ND 13	ND 10	NDII	ND 12
Bromodichloromethane	ug/Kg	ND 10	ND 11	ND 10	ND 10	ND 13	ND 10	ND 11	ND 12
1,2-Dichloropropane	ug/Kg	ND 10	ND II	ND 10	ND 10	ND 13	ND 10	ND II	ND 12
cis-1,3-Dichloropropene Trichloroethene	ug/Kg ug/Kg	ND 10 ND 10	ND 11 ND 11	ND 10 ND 10	ND 10 ND 10	ND 13 ND 13	ND 10	ND 11	ND 12
Benzene	ug/Kg	2 J	ND 11	ND 10	ND 10 ND 10	ND 13	ND 10 ND 10	ND 11 ND 11	ND 12 ND 12
Dibromochloromethane	ug/Kg	ND 10	ND 11	ND 10	ND 10	ND 13	ND 10	ND II	ND 12
trans-1,3-Dichloropropene	l ug/Kg	ND 10	ND 11	ND 10	ND 10	ND 13	ND 10	ND 11	ND 12
1,1,2-Trichloroethane	ug/Kg	ND 10	ND 11	ND 10	ND 10	ND 13	ND 10	ND 11	ND 12
Bromoform	ug/Kg	ND 10	ND 11	ND 10	ND 10	ND 13	ND 10	ND 11	ND 12
4-Methyl-2-pentanone (MIBK) 2-Hexanone	ug/Kg ug/Kg	ND 10 ND 10	ND 11 ND 11	ND 10 ND 10	ND 10 ND 10	ND 13	ND 10	ND II	ND 12
Tetrachloroethene	ug/Kg ug/Kg	5 J	ND II	4 3	3 j	ND 13 4-J	ND 10 14	ND 11	ND 12 ND 12
1,1,2,2-Tetrachloroethane	ug/Kg	ND 10	ND 11	ND 10	ND 10	ND 13	ND 10	ND 11	ND 12
Toluene	ug/Kg	ĺΙ	i J	ND 10	ND 10	2 1	ND 10	ND II	ND 12
Chlorobenzene	ug/Kg	18 J	4 J	4 J	2 J	4 J	2 Ј	ND 3	ND 4
Ethylbenzene	ug/Kg	ND 10	ND II	ND 10	ND 10	ND 13	» ND 10	ND 11	ND 12
Styrene	ug/Kg	ND 10	ND 11	ND 10	ND 10	ND 13	ND 10	ND 11	ND 12
Xylenes (total)	ug/Kg	ND 10	ND II	ND 10	ND 10	ND 13	ND 10	ND 11	ND 12
TCL Semi-volatiles							4		
Phenol	ug/Kg	ND 330	ND 370	- ND 330	ND 330	ND 440	. ND 340	ND 360	ND 410
i	-66		5,0	-1100	(45 330	ND THO	. 112 370	1415 200	110 410

21U:\DBASEGRP\CHEM\7000\7462\5a) Anal - SO/SE - Target Analyses

05/10/99

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

Date Printed: May 12, 1999

Page 6 (b)

AUGUST 1998 - APRIL 1999
<u>, </u>

Sample Location:	i	SS-11	SS-11A	SS-12	SS-12	SS-12A	SS-13	\$S-14	SS-15
Sample Depth:									
Sample Date:		08/05/1998	08/05/1998	08/05/1998	08/05/1998	08/05/1998	08/04/1998	08/04/1998	08/04/1998
		00/04/12/20	00100.1370	0010012330					
_	ĺ				Dupl,				
Parameters	<u>Units</u>								
more than to the	1								
TCL Semi-volatiles (Cont'd)									
Bis(2-chloroethyt)ether	ug/Kg	ND 100	ND 110	ND 100	ND 100	ND 130	ND 100	ND 110	ND 120
2-Chiorophenol	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440	ND 340	ND 360	ND 410
1,3-Dichlorobenzone	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440	ND 340	ND 360	ND 410
1,4-Dichlorobenzene	ug/Kg	ND 330	ND 370	ND 330	ND 330	97 J	ND 340	ND 360	ND 410
1,2-Dichlorobenzene	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440	ND 340	ND 360	ND 410
2-Methylphenol	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440	ND 340	ND 360	ND 410
2,2'-Oxybis(1-chloropropane)	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440	ND 340	ND 360	ND 410
4-Methylphenol	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440	ND 340	ND 360	ND 410
N-nitroso-di-n-propylamine Hexachloroethane	ug/Kg ug/Kg	ND 330 ND 330	ND 370 ND 370	ND 330 ND 330	ND 330 ND 330	ND 440	ND 340	ND 360	ND 410
Nitrobenzene	ug/Kg ug/Kg	ND 330	ND 370	ND 330	ND 330	760 ND 440	ND 340 ND 340	ND 360	ND 410 ND 410
Isophorone	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440	ND 340	ND 360 ND 360	ND 410 ND 410
2-Nitrophenol	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440	ND 340	ND 360	ND 410
2,4-Dimethylphenol	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440	ND 340	ND 360	ND 410
Bis(2-chloroethoxy)methane	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440	ND 340	ND 360	ND 410
2,4-Dichlorophenol	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440	ND 340	ND 360	ND 410
1,2,4-Trichlorobenzene	ug/Kg	ND 330	ND 370	ND 330	ND 330	50 J	ND 340	ND 360	ND 410
Naphthalene	ug/Kg	ND 330	ND 370	ND 330	ND 330	54 J	ND 340	ND 360	ND 410
4-Chloroaniline	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440	ND 340	ND 360	ND 410
Hexachlorobutadiene	ug/Kg	ND 330	ND 370	ND 330	ND 330	240 J	ND 340	ND 360	ND 410
4-Chloro-3-methylphenol	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440	ND 340	ND 360	ND 410
2-Methylnaphthalene	ug/Kg	ND 330	ND 370	ND 330	ND 330	110 J	ND 340	ND 360	ND 410
Hexachlorocyclopentadiene	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440	ND 340	ND 360	ND 410
2,4,6-Trichlorophenol	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440	ND 340	ND 360	ND 410
2,4,5-Trichlorophenol	ug/Kg	ND 800	ND 880	ND 800	ND 800	ND 1100	ND 830	ND 860	ND 990
2-Chloronaphthalene 2-Nitroaniline	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440	ND 340	ND 360	ND 410
Dimethyl phthalate	ug/Kg	ND 660 ND 330	ND 720	ND 660	ND 660	ND 870	ND 680	ND 710	ND 810
Acenaphthylene	ug/Kg ug/Kg	ND 330	ND 370 ND 370	ND 330 ND 330	ND 330 ND 330	ND 440 ND 440	ND 340	ND 360	ND 410
2,6-Dinitrotoluene	ug/Kg	ND 330	ND 370	ND 330	ND 330 ND 330		ND 340	ND 360	ND 410
3-Nitroaniline	ug/Kg	ND 660	ND 720	ND 660	ND 660	ND 440 ND 870	ND 340 ND 680	ND 360 ND 710	ND 410 ND 810
Acenaphthene	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440	ND 340	ND 360	ND 410
2,4-Dinitrophenol	ug/Kg	ND 660	ND 720	ND 660	ND 660	ND 870	ND 680	ND 710	ND 810
4-Nitrophenol	ug/Kg	ND 660	ND 720	ND 660	ND 660	ND 870	ND 680	ND 710	ND 810
Dibenzofuran	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440	ND 340	ND 360	ND 410
2,4-Dinitrotoluene	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440	ND 340	ND 360	ND 410
Diethyl phthalate	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440	ND 340	ND 360	ND 410
	······································	***************************************			//////////////////////////////////////	enselven en en den general betreken ingegeptigt.	NO. P. CALLES AND AND AND AND AND AND AND AND AND AND		**************************************

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION

OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Date Printed: May 12, 1999

Page 6 (c)

Time Printed: 2:18 pm

Sample Location:		SS-11	SS-11A	SS-12	SS-12	SS-12A	SS-13	SS-14	SS-15
Sample Depth:								**	
Sample Date:		08/05/1998	08/05/1998	08/05/1998	08/05/1998	08/05/1998	08/04/1998	08/04/1998	08/04/1998
				00/05/1770		00/03/1770	_00/04/1990	0010411990	08/04/1998
					Dupl.				
Parameters	<u>Units</u>								
TCL Semi-volatiles (Cont'd)									
Fluorene	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440	ND 340	ND 360	ND 410
4-Chlorophenyl phenylether	ug/Kg	ND 330	ND 370	ND 330	ND:330	ND 440	ND 340	ND 360	ND 410
4-Nitroaniline	ug/Kg	ND 660	ND 720	ND 660	ND 660	ND 870	ND 680	ND 710	ND 810
4,6-Dinitro-2-methylphenol N-nitrosodiphenylamine	ug/Kg	ND 660	ND 720	ND 660	ND 660	ND 870	ND 680	ND 710	ND 810
4-Bromophenyl phenylether	ug/Kg	ND 330 ND 330	ND 370	ND 330	ND 330	ND 440	ND 340	ND 360	ND 410
Pentachlorophenol	ug/Kg ug/Kg	ND 660	ND 370 ND 720	ND 330 ND 660	ND 330 ND 660	ND 440 100 J	ND 340 ND 680	ND 360	ND 410
Phenanthrene	ug/Kg	ND 330	ND 370	ND 330	ND 330	140 J	ND 340	ND 710 ND 360	ND 810 ND 410
Anthracene	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440	ND 340	ND 360	ND 410
Carbazole	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440	ND 340	ND 360	ND 410
Di-n-butyl phthalate	ug/Kg	83 J	ND 370	84 J	83 J	110 J	ND 340	ND 360	ND 410
Fluoranthene	ug/Kg	ND 330	ND 370	ND 330	ND 330	68 J	40 J	ND 36	ND 410
Pyrene	ug/Kg	37 J	ND 370	ND 330	43 J	140 J	39 J	36 J	ND 410
Burylbenzylphthalate Benzo(a)anthracene	ug/Kg	330 J	ND 370	300 J	330	ND 440	ND 340	ND 360	ND 410
3,3°+Dichlorobenzidine	ug/Kg ug/Kg	ND 330 ND 330	ND 370 ND 370	ND 330 ND 330	ND 330	ND 440	ND 340	ND 360	ND 410
Chrysene	ug/Kg	ND 330	ND 370	ND 330	ND 330 ND 330	ND 440 49 J	ND 340 ND 340	ND 360 ND 360	ND 410 ND 410
Bis(2-ethylhexyl)phthalate	ug/Kg	380	430	360	370	2500 J	860	1300	370 J
Di-n-octyl phthalate	ug/Kg	ND 330	110 J	ND 330	ND 330	360 J	130 J	260 J	43 J
Benzo(b)fluoranthene	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440 J	ND 340	ND 360	ND 410
Benzo(k)fluoranthene	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440 J	ND 340	ND 360	ND 410
Benzo(a)pyrene Indeno(1,2,3-cd)pyrene	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440 J	ND 340	ND 360	ND 410
Dibenz(a,h)anthracene	ug/Kg ug/Kg	ND 330 ND 330	ND 370 ND 370	ND 330	ND 330	ND 440 J	ND 340	ND 360	ND 410
Benzo(g,h,i)perylene	ug/Kg	ND 330	ND 370 ND 370	ND 330 ND 330	ND 330 ND 330	ND 440 J ND 440 J	ND 340	ND 360	ND 410
1,2-Diphenyl-hydrazine	ug/Kg	ND 330	ND 370	ND 330	ND 330	ND 440 J ND 440	ND 340 ND 340	ND 360 ND 360	ND 410
**************************************	**************************************				110 550	WO 970	טרכ עוו	טטנ עאי	ND 410
Hexachlorobenzene	ug/Kg	ND 330	ND 370	ND 330	ND 330	210 J	ND 340	ND 360	ND 410
TAL Metals									
Aluminum	mg/Kg	41000	9000	44000	49000	3000	2500	8500	
Antimony	mg/Kg	R	0.43 JL	R	49000 R	R	2300 R	8300 R	1400 R
Arsenic	mg/Kg	ND 2.8	3,2	7.7	\$. ₇	2.8	î.3	4.1	1.2
Barium	mg/Kg	870	42	930	1200	47	12	28	11
Beryllium	mg/Kg	140	0.55	150	170	0.81	0.23	0.44	ND 0.16
Cadmium	mg/Kg	38 J	0.052 B	22 J	92 J	0.61 J	0.034 B	ND 0.033	0.079 B

23U:\DBASEGRP\CHEM\7000\7462\5a) Anal - SO/SE - Target Analyses

05/10/99

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 6 (d)

Date Printed: May 12, 1999 Time Printed: 2:18 pm

TY, DELAWARE

Sample Location:		SS-11	SS-11A	SS-12	SS-12	SS-12A	SS-13	SS-14	SS-15
Sample Depth:					-	••			
Sample Date:		08/05/1998	08/05/1998	08/05/1998	08/05/1998	08/05/1998	08/04/1998	08/04/1998	08/04/1998_
	1				Dupl.				
Parameters	Units				•				
									
TAL Metals (Cont'd)									
Calcium	mg/Kg	62000	640	68000	75000	310000	470	600	350
Chromium	mg/Kg	220 J	22 J	210 J	420 J	9.4 J	6.1	18	4.8
Cobalt	mg/Kg	210	7.8	260	270	3.5	2.7	5.8	2.9
Copper	mg/Kg	16000	12	27000	20000	94	4.5	8.0	4.5
Iron Lead	mg/Kg mg/Kg	220000 7000	15000 . 7.3	240000 7100	270000 8400	9300	5700 5.4	16000	5600
Magnesium	mg/Kg	13000	910	14000	15000	51 7800	3.4 350	7.9 1200	3.7 230
Manganese	mg/Kg	4000	140	4600	5000	100	91	180	180
Mercury	mg/Kg	8.6 1	3.4 J	41 J	98 J	430 J	2.6 J	3.2 J	0.42 J
Nickel Potassium	mg/Kg	1700	8.7	1900	2000	15	3.4	7.7	2.7
Selenium	mg/Kg mg/Kg	2400 5.7 J	1000 0.64 J	2700 13 J	2900 18 J	760 ND 0.26 J	240 0.28 J	800 0.62 J	160 0.38 JK
Silver	mg/Kg	6.4 JK	0.18 JK	12 JK	9.2 JK	ND 0.080 J	0.26 J 0.14 JK	0.02 J 0.26 JK	
Sodium	mg/Kg	9700	1600	11000	12000	4300	17 B	35	75
Thallium	mg/Kg	ND 3.6	0.33 K	ND 3.6	ND 3.6	0.32 K	ND 0.19	0.53 K	ND 0.22
Vanadium Zine	mg/Kg	34 J	25 J	34 J	41 J	5.8 J	11 J	28 J	7.9 J
Methyl mercury	mg/Kg ug/Kg	59000 	33	64000	66000	400	24	26	31
,	wg, 11g			-		••			
General Chemistry									
Ammonia	mg/Kg				*************************			*::::::::::::::::::::::::::::::::::::::	
Sulfide	mg/Kg		••••••••••••••••••••••••••••••••••••••	•		· · · · · · · · · · · · · · · · · · ·			.
Coarse gravel (19.0 mm)	76	_	4	_		_	<u>.</u>	 	
Fine gravel (4.75 mm)	%	ee Saaaaaaaaa		66	**		- www.		was.
Coarse sand (2.00 mm) Medium sand (0.425 mm)	%				-		-		_
Fine sand (0.425 mm)	% %	 							
Silts/clays (<0.075 mm)	%					······································		•-	-
Total organic carbon (TOC)	mg/Kg	13000	2000	16000	14000	50000	4800	6600	530
-				e e e e eque e enconspirante o papara para la 12000.		erkeneren er er gulden grape in eile in der der der die de dagen gegen gegen gegen gegen gegen gegen gegen geg	en en en en en en en en en en en en en e		nnerventringen gegen britanist de på de 18. de de 19. de 19.

AUGUST 1998 - APRIL 1999

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

Page 7 (a)

Date Printed: May 12, 1999

Sample Location:		SS-16	SS-17	SS-18	WB-14	WB-15	WB-16	WB-16	WB-17
Sample Depth:					6-8 ft.	8-10 ft.	6-8 ft.	6-8 ft.	0-2 ft.
Sample Date:		08/04/1998	08/04/1998	08/04/1998	08/19/1998	08/25/1998	08/19/1998	08/19/1998	08/19/1998
								Dupl.	
<u>Parameters</u>	<u>Units</u>								
TCL Volatiles									
Chloromethane	ug/Kg	ND 11	ND 11	ND 11	ND 19	ND 22	ND 17	ND 17	ND 11
Bromomethane Vinyl chloride	ug/Kg	ND 11 ND 11	ND 11 ND 11	ND 11 ND 11	ND 19 ND 19	ND 22 ND 22	ND 17 ND 17	ND 17 ND 17	ND II ND II
Chloroethane	ug/Kg ug/Kg	ND II	ND11	ND 11	ND 19	ND 22 ND 22	ND 17 ND 17	ND 17 ND 17	ND II
Methylene chloride	ug/Kg	1 B	3 B	3 B	5 B	15 B	2 B	2 B	2 В
Acetone	ug/Kg	ND 11	ND 11	3 B	39 B	82	33 B	ND 17	12 B
Carbon disulfide	ug/Kg	ND 11	ND 11	ND 11	ND 19	ND 22	ND 17	ND 17	ND 11
1,1-Dichloroethene 1,1-Dichloroethane	ug/Kg ug/Kg	ND II ND II	ND 11 ND 11	ND 11 ND 11	ND 19 ND 19	ND 22 ND 22	ND 17 ND 17	ND 17 ND 17	ND 11 ND 11
1,2-Dichloroethene (total)	ug/Kg	ND 11	ND II	ND II	ND 19	ND 22 ND 22	ND 17	יו לא 17 ' לו לא	ND II
2-Butanone (MEK)	ug/Kg	ND 11	ND 11	ND 11	ND 19	31 J	ND 17	ND 17	ND 11
Chloroform	ug/Kg	ND 11	NDII	ND II	ND 19	ND 22	ND 17	ND 17	ND 11
1,2-Dichloroethane	ug/Kg	ND 11	ND 11	ND 11	ND 19	ND 22	ND 17	ND 17	ND 11
1,1,1-Trichloroethane Carbon tetrachloride	ug/Kg	ND II ND II	ND 11 ND 11	ND 11 ND 11	ND 19 ND 19	ND 22	ND 17	ND 17	ND 11
Bromodichloromethane	ug/Kg ug/Kg	ND II	ND II	ND 11	ND 19	ND 22 ND 22	ND 17 ND 17	ND 17 ND 17	ND 11 ND 11
1,2-Dichloropropane	ug/Kg	ND 11	ND 11	ND 11	ND 19	ND 22	ND 17	ND 17	ND 11
cis+1,3-Dichloropropene	ug/Kg	ND 11	ND 11	ND 11	MD 19	ND 22	ND 17	ND 17	ND 11
Trichloroethene	ug/Kg	ND 11	ND 11	ND 11	ND 19	ND 22	ND 17	ND 17	ND 11
Benzene Dibromochloromethane	ug/Kg	ND 11	ND II	ND II	9 J.	ND 22	5800 J	30000 J	ND 11
trans-1,3-Dichloropropene	ug/Kg ug/Kg	ND 11 ND 11	ND 11 ND 11	ND 11 ND 11	ND 19 ND 19	ND 22 ND 22	ND 18000 ND 17	ND 21000 ND 17	ND 11 ND 11
1,1,2-Trichloroethane	ug/Kg	ND 11	ND 11	ND 11	ND 19	ND 22	ND 18000	ND 21000	ND 11
Bromoform	ug/Kg	ND 11	ND 11	ND 11	ND 19	ND 22	ND 18000	ND 21000	ND II
4-Methyl-2-pentanone (MIBK)	ug/Kg	ND 11	ND 11	ND 11	ND 19	ND 22	ND 18000	ND 21000	ND 11
2-Hexanone Tetrachloroethene	ug/Kg	ND 11	ND II	ND II	ND 19	ND 22	ND 18000	ND 21000	ND II
1,1,2,2-Tetrachloroethane	ug/Kg ug/Kg	ND 11 ND 11	I J ND II	5 J ND 11	29 J ND 19	ND 22 ND 22	ND 18000 ND 18000	ND 21000 ND 21000	9 B ND 11
Toluene	ug/Kg	ND 11	ND 11	ND 11	ND 19	ND 22	ND 18000	ND 21000	ND 11
Chlorobenzene	ug/Kg	ND 3	ND 3	ND 3	37	ND 22	93000 1	430000 J	4 B
Ethylbenzene	ug/Kg	ND 11	ND 11	ND 11	ND 19	ND 22	ND 18000	ND 21000	ND 11
Styrene	ug/Kg	NDII	ND 11	ND 11	ND 19	ND 22	ND 18000	ND 21000	ND II
Xylenes (total)	ug/Kg	ND 11	ND 11	ND 11	3 J	6 J	ND 18000	ND 21000	ND 11
TCL Semi-volatiles									
Phenol	ug/Kg	ND 360	ND 370	ND 360	ND 610	ND 570 J	ND 550	710	ND 370

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION

DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 7 (b)

Date Printed: May 12, 1999 Time Printed: 2:18 pm

Sample Location:		SS-16	SS-17	SS-18	WB-14	WB-15	WB-16	WB-16	WB-17
Sample Depth:					6-8 ft.	8-10 ft.	6-8 ft.	6-8 ft.	0-2 ft.
Samole Date:		08/04/1998	08/04/1998	08/04/1998	08/19/1998	08/25/1998	08/19/1998	08/19/1998	08/19/1998
			00/0 //2220					Dupl.	00/13/1338
Parameters	Units							ւթարւ.	
atameters	Omis								
TCL Semi-volatiles (Cont'd)									
Bis(2-chloroethyl)ether	ug/Kg	ND 110	ND 110	ND 110	ND 190	ND 170 J	ND 170	ND 170	ND 110
2-Chlorophenol	ug/Kg	ND 360	ND 370	ND 360	ND 610	ND 570 J	1100	840	ND 370
1,3-Dichlorobenzene 1,4-Dichlorobenzene	ug/Kg ug/Kg	. ND 360 ND 360	ND 370 120 J	ND 360 ND 360	ND 610 190. J	ND 570 J 300 J	6900 J 120000 J	2900 J 51000 J	ND 370
1,2-Dichlorobenzene	ug/Kg	ND 360	150 J	ND 360	190 J 120 J	300 J 140 J	110000 J	46000 J	ND 370 ND 370
2-Methylphenol	ug/Kg	ND 360	ND 370	ND 360	ND 610	ND 570 J	ND 550	ND 560	ND 370
2,2'-Oxybis(1-chloropropane)	ug/Kg	ND 360	ND 370	ND 360	ND 610	ND 570 J	ND 510	ND 560	ND 370
4-Methylphenol	ug/Kg	ND 360	ND 370	ND 360	200 J	240. J	210 J	150 J	ND 370
N-nitroso-di-n-propylamine	ug/Kg	ND 360	ND 370	ND 360	ND 610	ND 570 J	ND 550	ND 560	ND 370
Hexachloroethane	ug/Kg	ND 360	ND 370	ND 360	ND 610	ND 570 J	ND 550	ND 560	ND 370
Nitrobenzene	ug/Kg	ND 360	ND 370	ND 360	ND 610	ND 570 J	ND 550	ND 560	ND 370
Isophorone 2-Nitrophenol	ug/Kg ug/Kg	ND 360 ND 360	ND 370 ND 370	ND 360 ND 360	ND 610 ND 610	ND 570 J ND 570 J	ND 550 ND 550	ND 560 ND 560	ND 370 ND 370
2,4-Dimethylphenol	ug/Kg	ND 360	ND 370	ND 360	ND 610	ND 570 J	ND 550	ND 560	ND 370
Bis(2-chloroethoxy)methane	ug/Kg	ND 360	ND 370	ND 360	ND 610	ND 570 J	ND 550	ND 560	ND 370
2,4-Dichlorophenol	ug/Kg	ND 360	ND 370	ND 360	ND 610	ND 570 J	140 J	L OIT	ND 370
1,2,4-Trichlorobenzene	ug/Kg	ND 360	45 J	ND 360	63 J	ND 570 J	52000 J	20000 J	ND 370
Naphthalene	ug/Kg	ND 360	ND 370	ND 360	140 J	460 1	570	500 J	ND 370
4-Chloroaniline Hexachlorobutadiene	ug/Kg	ND 360	ND 370	ND 360	ND 610	ND 570 J	ND 550	ND 560	ND 370
4-Chloro-3-methylphenol	ug/Kg ug/Kg	ND 360 ND 360	ND 370 ND 370	ND 360 ND 360	ND 610 ND 610	ND 570 J ND 570 J	ND 550 ND 550	ND 560 ND 560	ND 370
2-Methylnaphthalene	ug/Kg	ND 360	65 J	ND 360	950	2300 J	ND 550	ND 560	ND 370 ND 370
Hexachlorocyclopentadiene	ug/Kg	ND 360	ND 370	ND 360	ND 610	ND 570 J	ND 550	ND 560	ND 370
2,4,6-Trichlorophenol	ug/Kg	ND 360	ND 370	ND 360	ND 610	ND 570 J	ND 550	ND 560	ND 370
2,4,5-Trichlorophenol	ug/Kg	ND 860	ND 880	ND 870	ND 1500	ND 1400 J	ND 1300	ND 1400	ND 890
2-Chloronaphthalene	ug/Kg	ND 360	ND 370	ND 360	ND 610	ND 570 J	ND 550	ND 560	ND 370
2-Nitroaniline	ug/Kg	ND 700	ND 720	ND 710	ND 1200	ND 1100 J	ND 1100	ND 1100	ND 730
Dimethyl phthalate Acenaphthylene	ug/Kg	ND 360	ND 370	ND 360	ND 610	ND 570 J	ND 550	ND 560	ND 370
2,6-Dinitrotoluene	ug/Kg ug/Kg	ND 360 ND 360	ND 720 ND 370	ND 360 ND 360	ND 610 ND 610	ND 570 J ND 570 J	ND 550 ND 550	ND 560 ND 560	ND 370 ND 370
3-Nitroaniline	ug/Kg	ND 700	ND 720	ND 710	ND 1200	ND 1100 J	ND 1100	ND 1100	ND 730
Acenaphthene	ug/Kg	ND 360	ND 370	ND 360	79 1	220 j	ND 550	ND 560	ND 370
2,4-Dinitrophenol	ug/Kg	ND 700	ND 720	ND 710	ND 1200 J	ND 1100 J	ND 1100 J	ND 1100 J	ND 730 J
4-Nitrophenol	ug/Kg	ND 700	ND 720	ND 710	ND 1200	ND 1100 J	ND 1100	ND 1100	ND 730
Dibenzofuran	ug/Kg	ND 360	ND 370	ND 360	ND 610	ND 570 J	ND 550	ND 560	ND 370
2,4-Dinitrotoluene Diethyl phthalate	ug/Kg	ND 360	ND 370	ND 360	ND 610	ND 570 J	ND 550	ND 560	ND 370
Dienty phinarate	ug/Kg	ND 360	ND 370	ND 360	ND 610	ND 570 J	ND 550	ND 560	ND 370

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 7 (c)

Date Printed: May 12, 1999

Sample Location:		SS-16	SS-17	SS-18	WB-14	WB-15	WB-16	WB-16	WB-17
Sample Depth:				••	6-8 ft.	8-10 ft.	6-8 ft.	6-8 ft,	0-2 ft.
Sample Date:		08/04/1998	08/04/1998	08/04/1998	08/19/1998	08/25/1998	08/19/1998	08/19/1998	08/19/1998
Sample Date:	i	08/04/1998	08/04/1998	00/04/1990	00/19/1990	<u> </u>	08/19/1998		08/19/1998
								Dupl.	
<u>Parameters</u>	<u>Units</u>								
TCL Semi-volatiles (Cont'd)	<u>.</u>								
Fluorene	ug/Kg	ND 360	ND 370	ND 360	89 J	330 J	ND 550	ND 560	ND 370
4-Chlorophenyl phenylether	ug/Kg	ND 360	ND 370	ND 360	ND 610	ND 570 J	ND 550	ND 560	ND 370
4-Nitroaniline	ug/Kg	ND 700	ND 720	ND 710	ND 1200	ND 1100 J	ND 1100	ND 1100	ND 730
4,6-Dinitro-2-methylphenol	ug/Kg	ND 700	ND 720	ND 710	ND 1200	ND 1100 J	ND 1100	ND 1100	ND 730
N-nitrosodiphenylamine	ug/Kg	ND 360	ND 370	ND 360	ND 610	ND 570 J	ND 550	ND 560	ND 370
4-Bromophenyl phenylether	ug/Kg	ND 360	ND 370	ND 360	ND 610	ND 570 J	ND 550	ND 560	ND 370
Pentachlorophenol	ug/Kg	ND 700	ND 720	ND 710	ND 1200	ND 1100 J	ND 1100	ND 1100	ND 730 J
Phenanthrene	ug/Kg	ND 360	71 J	ND 360	330 J	1000 J	66 J	73 J	ND 370
Anthracene	ug/Kg	ND 360	ND 370	ND 360	72 J	210 J	ND 550	ND 560	ND 370
Carbazole	ug/Kg	ND 360	ND 370	ND 360	ND 610	ND 570 J	ND 550	ND 560	ND 370
Di-n-butyl phthalate	ug/Kg	ND 360	ND 370	ND 360	ND 610	ND 570 J 320 J	ND 550	ND 560	ND 370
Fluoranthene Pyrene	ug/Kg	ND 360 ND 360	40 J 44 J	ND 360 ND 360	120 J 150 J	320 J 530 J	66 J 67 J	72 J 82 J	44 J 71 J
Butylbenzylphthalate	ug/Kg ug/Kg	ND 360 ND 360	65 J	ND 360	ND 610	ND 570 J	ND 550	ND 560	ND 370
Benzo(a)anthracene	ug/Kg	ND 360 ND 360	ND 370	ND 360	ND 610	250 J	ND 550	ND 560	ND 370
3,3'-Dichlorobenzidine	ug/Kg	ND 360	ND 370	ND 360	ND 610	ND 570 J	ND 550	ND 560	ND 370
Chrysene	ug/Kg	ND 360	ND 370	ND 360	96 J	290 J	ND 550	57 J	
Bis(2-ethylhexyl)phthalate	ug/Kg	170 J	1900	ND 360	ND 610	510 B	ND 550	ND 560	ND 370
Di-n-octyl phthalate	ug/Kg	ND 360	360 J	ND 360	ND 610	ND 570 J	ND 550	ND 560	ND 370
Benzo(b)fluoranthene	ug/Kg	ND 360	ND 370	ND 360	ND 610	140 J	ND 550	ND 560	ND 370
Benzo(k)fluoranthene	ug/Kg	ND 360	ND 370	ND 360	ND 610	200 I	ND:550	ND 560	41 J
Benzo(a)pyrene	ug/Kg	ND 360	ND 370	ND 360	ND 610	190 J	ND 550	ND 560	49 J
Indeno(1,2,3-ed)pyrene	ug/Kg	ND 360	ND 370	ND 360	ND 610	140 J	ND 550	ND 560	ND 370
Dibenz(a,h)anthracene	ug/Kg	ND 360	ND 370	ND 360	ND 610	89 J	ND 550	ND 560	ND 370
Benzo(g,h,i)perylene	ug/Kg	ND 360	ND 370	ND 360	ND 610	240 J	ND 550	ND 560	46 J
1,2-Diphenyl-hydrazine	ug/Kg	ND 360	ND 370	ND 360	ND 610	ND 570 J	ND 550	ND 560	ND 370
Hexachlorobenzene	ug/Kg	ND 360	200 J	ND 360	ND 610	ND 570 J	ND 550	ND 560	ND 370
TAL Metals									
Aluminum	mg/Kg	7300	4700	15000	16000 J	18000 J	17000	14000 J	15000
Antimony	mg/Kg	R	R	R	1.8 L	1.8 L		2.4 L	ND 0.34 : L
Arsenic	mg/Kg	3.0	1.6	6.3	27 J	31 J	24	17 J	3.1
Barium	mg/Kg	34	100	39	77	85	1300	1000	57
Beryllium	mg/Kg	0.41	0.30	0.54	1.5	1.9	1.3	1.3	0.53
Cadmium	mg/Kg	ND 0.033	0.18 B	ND 0.034	0.76	0.92	1.7	ND 0.053	0.14

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION **DELAWARE CITY, DELAWARE**

Date Printed: May 12, 1999

Page 7 (d)

AUGUST 1998 - APRIL 1999
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Sample Location: Sample Depth:		SS-16 	SS-17 	SS-18 	WB-14 6-8 ft.	WB-15 8-10 ft.	WB-16 6-8 ft.	WB-16 6-8 ft.	WB-17 0-2 ft.
Sample Date:	:	08/04/1998	08/04/1998	08/04/1998	08/19/1998	08/25/1998	08/19/1998	08/19/1998_ Dupl.	08/19/1998
<u>Parameters</u>	<u>Units</u>								
TAL Metals (Cont'd)									
Calcium Chromium	mg/Kg mg/Kg	530 13	1900 9.5	720 25	2800 J 96 J	3100 J 110 J	12000 120	8900 J 120 J	530 18
Cobalt Copper	mg/Kg mg/Kg	13 6.4	9,5 3,5 7,6	9.1 11	21 75	24 88	17 67	15 65	3.3 6.8
Iron Lead	mg/Kg mg/Kg	14000 10	10000 4.5	27000 16	36000 J 160 JL	41000 J 190 JL	32000 130	32000 J 140 JI	11000 LI
Magnesium Manganese	mg/Kg mg/Kg	720 420	610 180	1700 230	6000 J 1100 J	6700 J 1300 J	6200 870	5600 J 650 J	1000 41
Mercury Nickel Potassium	mg/Kg mg/Kg	0.94 J 6.0 460	3.0 J 7.2 420	0,31 J 12	1.7 L 35 J	3.7 41 J	350 J 30	4500 JI 27 J	6.7
Selenium Silver	mg/Kg mg/Kg mg/Kg	0.61 J 0.35 JK	0.40 J 0.13 JK	1000 0.95 J 0.81 JK	2400 2,7 L 1,6	2800 3.3 L 1.7	3300 2.6 0.88 J	. 2700 2.3 L 1.7 J	540 0.29 K ND 0.067
Sodium Thallium	mg/Kg mg/Kg	20 B ND 0.19	79 0.33 K	28 B ND 0.19	2600 0.93	3700 1.0	4800 ND 0.30	4900 0.65	62 ND 0.20
Vanadium Zinc	mg/Kg mg/Kg	22 J 20	14 1 35	42 J 34	70 I 420 J	80 J 480 J	65 420	62 J 340 J	28 22
Methyl mercury	ug/Kg	-	-				-	<u></u>	.
General Chemistry									
Ammonia Sulfide	mg/Kg mg/Kg	-	 	 	 	- -	 	 	<u></u>
Coarse gravel (19.0 mm) Fine gravel (4.75 mm) Coarse sand (2.00 mm)	% % %	- -	 	 		-	-	-	
Medium sand (0.425 mm) Fine sand (0.075 mm)	% % %	-	- -	- -		- -	-	-	
Silts/clays (<0.075 mm) Total organic carbon (TOC)	% % mg/Kg	 11000	 1700	 5700	 50000 K	 46000 K	 46000	- 46000 K	4200

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

Page 8 (a)
Date Printed: May 12, 1999

Time Printed: 2:18 pm

AUGUST 1998 - APRIL 1999

Sample Location:		WB-17	WB-18	WB-18	WB-19	WB-19	WB-19	WB-20	WB-21
Sample Depth:		6-8 ft.	0-2 ft.	8-10 ft.	0-2 ft.	8-10 ft.	8-10 ft.	8-10 ft.	6-8 ft,
Sample Date:		08/19/1998	08/18/1998	08/18/1998	08/20/1998	08/20/1998	08/20/1998	08/24/1998	08/24/1998
					00:20:1550	00120/1990	Dupl.	00/24/1770	00/24/1770
Parameters	<u>Units</u>						Dupi.		
r manicicis	Oms								
TCL Volatiles									
Chloromethane	ug/Kg	ND 18	ND H	ND 14	ND II	ND 17	ND 18	ND 16	ND 21
Bromomethane	ug/Kg	ND 18	ND 11	ND 14	ND 11	ND 17	ND 18	ND 16	ND 21
Vinyl chloride	ug/Kg	81 DN	ND 11	ND 14	ND 11	ND 17	ND 18	ND 16	ND 21
Chloroethane	ug/Kg	ND 18	ND 11	ND 14	ND 11	ND 17	ND 18	ND 16	ND 21
Methylene chloride Acetone	ug/Kg	7 B 44 B	ND 11	ND 14	3 B	3 B	4 B	10 B	18 B
Carbon disulfide	ug/Kg ug/Kg	44 B ND 18	ND 11 ND 11	30 B ND 14	ND 11 ND 11	27 B	27 В	30	39
1.1-Dichloroethene	ug/Kg	ND 18	ND 11	ND 14	ND 11	ND 17 ND 17	ND 18 ND 18	ND 16 ND 16	ND 21
1,1-Dichloroethane	ug/Kg	ND 18	ND II	ND 14	ND 11	ND 17	ND 18	ND 16	ND 21 ND 21
1,2-Dichloroethene (total)	ug/Kg	ND 18	ND 11	ND 14	ND 11	ND 17	ND 18	ND 16	ND 21
2-Butanone (MEK)	ug/Kg	17 J	ND II	ND 14	ND H	ND 17	ND 18	ND 16	ND 21
Chloroform	ug/Kg	ND 18	ND 11	ND 14	ND 11	ND 17	ND 18	ND 16	ND 21
1,2-Dichloroethane	ug/Kg	ND 18	ND 11	ND 14	ND 11	ND 17	ND 18	ND 16	ND 21
1,1,1-Trichloroethane	ug/Kg	ND 18	ND 11	ND 14	ND 11	ND 17	ND 18	ND 16	ND 21
Carbon tetrachloride	ug/Kg	ND 18	ND II	ND 14	ND II	ND 17	ND 18	ND 16	ND 21
Bromodichloromethane 1,2-Dichloropropane	ug/Kg	ND 18	ND 11	ND 14	ND 11	ND 17	ND 18	ND 16	ND 21
cis-1,3-Dichloropropene	ug/Kg	ND 18	ND II	ND 14	ND 11	ND 17	ND 18	ND 16	ND 21
Trichforgethene	ug/Kg ug/Kg	ND 18	ND 11 ND 11	ND 14 ND 14	ND 11	ND 17	ND 18	ND 16	ND 21
Benzene	ug/Kg	ND 18 5 J	ND 11	ND 14 ND 14	ND 11 ND 11	ND 17	ND 18	ND 16	ND 21
Dibromochloromethane	ug/Kg	וו מא	ND II	ND 14	ND II	ND 17 ND 17	ND 18 ND 18	ND 16 ND 16	ND 21 ND 21
trans-1,3-Dichloropropene	ug/Kg	ND 18	ND 11	ND 14	ND 11	ND 17	ND 18	ND 16	ND 21
1,1,2-Trichloroethane	ug/Kg	ND 18	ND II	ND 14	ND II	ND 17	ND 18	ND 16	ND 21
Bromoform	ug/Kg	ND 18	ND 11	ND 14	ND 11	ND 17	ND 18	ND 16	ND 21
4-Methyl-2-pentanone (MIBK)	ug/Kg	ND 18	ND 11	ND 14	ND 11	ND 17	ND 18	ND 16	ND 21
2-Hexanone	ug/Kg	ND 18	ND II	ND 14	ND 11	ND 17	ND 18	ND 16	ND 21
Tetrachloroethene	ug/Kg	13.B	12 J	6 B	4 B	ND 17	5 B	ND 16	ND 21
1,1,2,2-Tetrachloroethane Toluene	ug/Kg	ND 18	ND 11	ND 14	ND 11	ND 17	ND 18	ND 16	ND 21
Chlorobenzene	ug/Kg	ND 18	וו מא	ND 14	ND II	ND 17	ND 18	ND 16	ND 21
Ethylbenzene	ug/Kg	72 NIN 18	ND 11	2 J	3 B	4 B	5 B	ND 16	3 B
Styrene	ug/Kg ug/Kg	ND 18 ND 18	ND II	ND 14	ND 11	ND 17	ND 18	ND 16	ND 21
Xylenes (total)	ug/Kg	ND 16 5 J	ND 11 ND 11	ND 14 2 J	ND II ND II	ND 17 5 J	ND 18	ND 16 ND 16	ND 21 ND 21
							0.4	NDIU	ND 21
TCL Semi-volatiles									
Phenol	ug/Kg	ND 610	ND 370	ND 480	ND 380	ND 570	ND 590	ND 530 J	ND 580 J
i									

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 8 (b)

Date Printed: May 12, 1999

Sample Location:		WB-17	WB-18	WB-18	WB-19	WB-19	WB-19	WB-20	WB-21
Sample Depth:		6-8 ft.	0-2 ft.	8-10 ft.	0-2 ft.	8-10 ft.	8-10 ft.	8-10 ft.	6-8 ft.
Sample Date:		08/19/1998	08/18/1998	08/18/1998	08/20/1998	08/20/1998	08/20/1998	08/24/1998	08/24/1998
							Dupl.		 .
<u>Parameters</u>	<u>Units</u>								
TCL Semi-volatiles (Cont'd)									
	A construction of the cons				Canada malababababababababababababababababababa			A CONT. AND A CONTROL A CONTROL TO MANAGEMENT	and the Carlo cally the county and the second carlo
Bis(2-chloroethyf)ether 2-Chlorophenol	ug/Kg	ND 180 ND 610	ND 110 ND 370	ND 150 ND 480	ND 110 ND 380	ND 170	ND 180	ND 160 J	ND 180 J
1,3-Dichlorobenzene	ug/Kg ug/Kg	ND 610	ND 370	ND 480 ND 480	ND 380	ND 570 ND 570	ND 590 ND 590	ND 530 J ND 530 J	ND 580 J ND 580 J
1,4-Dichlorobenzene	ug/Kg	190 J	ND 370	170 J	95 J	61 J	89 J	200 J	110 J
1,2-Dichlorobenzene	ug/Kg	65 J	230 J	61 J	240 J	ND 570	73 1	140 j	95 J
2-Methylphenol	ug/Kg	ND 610	ND 370	ND 480	ND 380	ND 570	ND 590	ND 530 J	ND 580 J
2,2'-Oxybis(1-chloropropane)	ug/Kg	ND 610	ND 370	ND 480	ND 380	ND 570	ND 590	ND 530 J	ND 580 J
4-Methylphenol	ug/Kg	150 J	ND 370	ND 480	ND 380	160 J	150 J	250 J	220 J
N-nitroso-di-n-propylamine	ug/Kg	ND 610	ND 370	ND 480	ND 380	ND 570	ND 590	ND 530 J	ND 580 J
Hexachloroethane Nitrobenzene	ug/Kg	ND 610 ND 610	ND 370 ND 370	ND 480 ND 480	ND 380	ND 570	ND 590	ND 530 J	ND 580 J
Isophorone	ug/Kg ug/Kg	ND 610	ND 370	ND 480	ND 380 72. J	ND 570 ND 570	ND 590 ND 590	ND 530 1 ND 530 J	ND 580 J ND 580 J
2-Nitrophenol	ug/Kg	ND 610	ND 370	ND 480	ND 380	ND 570	ND 590	ND 530 J	ND 580 J
2,4-Dimethylphenol	ug/Kg	ND 610	ND 370	ND 480	ND 380	ND 570	ND 590	ND 530 J	ND 580 J
Bis(2-chloroethoxy)methane	ug/Kg	ND 610	ND 370	ND 480	ND 380	ND 570	ND 590	ND 530 J	ND 580 J
2,4-Dichlorophenol	ug/Kg	ND 610	ND 370	ND 480	ND 380	ND 570	ND 590	ND 530 J	ND 580 J
1,2,4-Trichlorobenzene	ug/Kg	ND 610	300 J	ND 480	1100	ND 570	ND 590	53 J	ND 580 J
Naphthalene	ug/Kg	88 J	ND 370	66 J	ND 380	130 J	210 J	260 J	260 J
4-Chloroaniline Hexachlorobutadiene	± ug/Kg	ND 610	ND 370	ND 480	ND 380	ND 570	ND 590	ND 530 J	ND 580 J
4-Chloro-3-methylphenol	ug/Kg ug/Kg	ND 610 ND 610	ND 370 ND 370	ND 480 ND 480	ND 380 ND 380	ND 570 ND 570	ND 590 ND 590	ND 530 J ND 530 J	ND 580 J ND 580 J
2-Methylnaphthalene	ug/Kg	550 J	ND 370	62 J	ND 380	410 J	720	730 J	ND 300 J 290 J
Hexachlorocyclopentadiene	ug/Kg	ND 610	ND 370	ND 480	ND 380	ND 570	ND 590	ND 530 J	ND 580 J
2,4,6-Trichlorophenol	ug/Kg	ND 610	ND 370	ND 480	ND 380	ND 570	ND 590	ND 530 J	ND 580 J
2,4,5-Trichlorophenol	ug/Kg	ND 1500	ND 880	ND 1200	ND 910	ND 1400	ND 1400	ND 1300 J	ND 1400 J
2-Chloronaphthalene	ug/Kg	ND 610	ND 370	ND 480	ND 380	ND 570	ND 590	ND 530 J	ND 580 J
2-Nitroaniline	ug/Kg	ND 1200	ND 720	ND 950	ND 740	ND 1100	ND 1200	ND 1000 J	ND 1100 T
Dimethyl phthalate	ug/Kg	ND 610	ND 370	ND 480	ND 380	ND 570	ND 590	ND 530 J	ND 580 J
Acenaphthylene 2.6-Dinitrotoluene	ug/Kg ug/Kg	ND 610 ND 610	ND 370 ND 370	ND 480 ND 480	ND 380 ND 380	ND 570 ND 570	ND 590 ND 590	ND 530 J ND 530 J	ND 580 J ND 580 J
3-Nitroaniline	ug/Kg	ND 1200	ND 720	ND 950	ND 740	ND 1100	ND 1200	I 000 DN	ND:1100 J
Acenaphthene	ug/Kg	ND 610	ND 370	ND 480	ND 380	ND 570	96 J	73 J	ND 580 J
2,4-Dinkrophenol	ug/Kg	ND 1200 J	ND 720	ND 950	ND 740 J	ND 1100 J	ND 1200 J	ND 1000 J	ND 1100 J
4-Nitrophenol	ug/Kg	ND 1200	ND 720	ND 950	ND 740	ND 1100	ND 1200	ND 1000 J	ND 1100 J
Dibenzofuran	ug/Kg	ND 610	ND 370	ND 480	ND 380	ND 570	ND 590	ND 530 J	ND 580 J
2,4-Dinitrotoluene	ug/Kg	ND 610	ND 370	ND 480	ND 380	ND 570	ND 590	ND 530 J	ND 580 J
Diethyl phthalate	ug/Kg	ND 610	ND 370	ND 480	ND 380	ND 570	ND 590	ND 530 J	ND 580 J

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION

OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 8 (c)

Date Printed: May 12, 1999

Sample Location:		WB-17	WB-18	WB-18	WB-19	WB-19	WB-19	WB-20	WB-21
Sample Depth:		6-8 ft.	0-2 ft.	8-10 ft.	0-2 ft.	8-10 ft.	8-10 ft.	8-10 ft.	6-8 ft.
Sample Date:		08/19/1998	08/18/1998	08/18/1998	08/20/1998	08/20/1998	08/20/1998	08/24/1998	08/24/1998
							Dupl.		
Parameters Parameters	<u>Units</u>						,		
TCL Semi-volatiles (Cont'd)									
Fluorene	ug/Kg	ND 610	ND 370	ND 480	ND 380	59 J	130 J	140 J	68 J
4-Chlorophenyl phenylether 4-Nitroaniline	ug/Kg	ND 610 ND 1200	ND 370 ND 720	ND 480	ND 380	ND 570	ND 590	ND 530 J	ND 580 J
4.6-Dinitro-2-methylphenol:	ug/Kg ug/Kg	ND 1200	ND 720 ND 720	ND 950 ND 950	ND 740 ND 740	ND 1100 ND 1100	ND 1200 ND 1200	ND 1000 J ND 1000 J	ND 1100 J ND 1100 J
N-nitrosodiphenylamine	ug/Kg	ND 610	ND 370	ND 480	ND 380	ND 570	ND 590	ND 530 J	ND 580 J
4-Bromophenyl phenylether	ug/Kg	ND 610	ND 370	ND 480	ND 380	ND 570	ND 590	ND 530 J	ND 580 J
Pentachlorophenol	ug/Kg	ND 1200	ND 720	ND 950	ND 740	ND 1100	ND 1200	ND 1000 J	ND 1100 J
Phenanthrene	ug/Kg	190 J	76 J	89 J	ND 380	180 J	430 J	400 J	180 J
Anthracene Carbazole	ug/Kg	ND 610	ND 370	ND 480	ND 380	ND 570	100 J	98 J	110 J
Di-n-butyl phthalate	ug/Kg ug/Kg	ND 610 ND 610	ND 370 ND 370	ND 480 ND 480	ND 380 ND 380	ND 570 ND 570	ND 590 ND 590	ND 530 J ND 530 J	ND 580 J ND 580 J
Fluoranthene	ug/Kg	68 J	ND 370	89 J	ND 380	ND 370 75 J	210 J	190 J	220 J
Ругепе	ug/Kg	1 78	82 J	120 Ј	ND 380	, 98 J	310 J	300 J	360 J
Butylbenzylphthalate	ug/Kg	ND 610	ND 370	ND 480	ND 380	ND 570	ND 590	ND 530 J	ND 580 J
Benzo(a)anthracene	ug/Kg	ND 610	ND 370	70 J	ND 380	ND 570	140 J	130 J	170 J
3,3'-Dichlorobenzidine Chrysene	ug/Kg	ND 610	ND 370	ND 480	ND 380	ND 570	ND 590	ND 530 J	ND 580 J
Bis(2-ethylhexyl)phthalate	ug/Kg ug/Kg	ND 610 ND 610	40 J 580	87 J ND 1100	ND 380 430	63 J ND 570	180 J 460 B	170 J ND 530 J	190 J 330 B
Di-n-octyl phthalate	ug/Kg	ND 610	ND 370	ND 480	ND 380	ND 570	ND 590	ND 530 J	ND 580 J
Benzo(b)fluoranthene	ug/Kg	ND 610	ND 370	56 J	ND 380	ND 570	97 J	130 J	130 J
Benzo(k)fluoranthene	ug/Kg	ND 610	ND 370	77 J	ND 380	ND 570	130 J	91 J	100 J
Benzo(a)pyrene	ug/Kg	ND 610	ND 370	210 J	ND 380	ND 570	130 1	130 J	130 J
Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene	ug/Kg	ND 610	ND 370	57 J	ND 380	ND 570	82 J	92 J	120 J
Benzo(g,h,i)perylene	ug/Kg ug/Kg	ND 610 ND 610	ND 370 ND 370	ND 480 75 J	ND 380 ND 380	ND 570 ND 570	ND 590	56 J 140 J	ND 580 J 160 J
1,2-Diphenyl-hydrazine	ug/Kg	ND 610	ND 370	ND 480	ND 380	ND 570	110 J ND 590	ND 530 J	ND 580 J
		Agenda a suga daga san isa sadah katan dababba		un anno ang ang ana ang ang ang ang ang ang ang		·····			
Hexachlorobenzene	ug/Kg	ND 610	51 J	ND 480	ND 380	ND 570	ND 590	ND 530 J	ND 580 J
TAL Metals									
Aluminum	mg/Kg	17000 J	11000	16000	9300 J	17000 J	16000 J	14000 J	15000 J
Antimony	mg/Kg	2.1 L	0.59 L	1.8 L	0.57 L	1.8 L	1.8 L __	1.3 L	1.2 L
Arsenic	mg/Kg	27 Ј	6.6	16	5.0 J	26 J	24 J	24 J	26 J
Barium	mg/Kg	82	81	63	55	80	73	72	74
Beryllium Cadmium	mg/Kg mg/Kg	1.7	0.68 0.36	1.1	0,71	1.5	1,4	1.3	1.5
Caumum	mg/rg	1.2	0.30	1.1	ND 0.035	0.59	0.45	0.73	0.62

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

Page 8 (d)
Date Printed: May 12, 1999

Time Printed: May 12, 19

AUGUST 1998 - APRIL 1999

Sample Location: Sample Depth: Sample Date:		WB-17 6-8 ft. 08/19/1998	WB-18 0-2 ft. 	WB-18 8-10 ft. 08/18/1998	WB-19 0-2 ft. 08/20/1998	WB-19 8-10 ft. _08/20/1998	WB-19 8-10 ft. _08/20/1998	WB-20 8-10 ft. 08/24/1998	WB-21 6-8 ft. _08/24/1998
<u>Parameters</u>	<u>Units</u>						Dupl.		
TAL Metals (Cont'd)									
Calcium Chromium	mg/Kg mg/Kg	2400 J 100 J	800 25	2300 65	920 J 30 J	2600 J 98 J	2500 J 90 J	2700 J 87 J	2300 J 92 J
Cobalt Copper	mg/Kg mg/Kg	21 83	6.9 11	16 38	7.1 16	20 74	18 66	19 67	22 70
iron Lead Magnesium	mg/Kg mg/Kg	37000 J 170 JL 5800 J	21000 15 1700	27000 98	19000 J 14 JL	38000 J 160 JL	35000 J 140 J	33000 J 140 JL	
Manganese Mercury	mg/Kg mg/Kg mg/Kg	670 J 70 L	210 4,6 J	4800 1000 25. J	2000 J 150 J 1.8	6100 J 950 J 4.7	5700 J 870 J 3.2	5500 J 1100 J 7.6	5000 J 1300 J 1,1
Nickel Potassium	mg/Kg mg/Kg	38 J 3100	11 1000	27 3100	12 J 1200	36 J 3400	33 J 3300	32 J 2300	36 J 4700
Selenium Silver	mg/Kg mg/Kg	2.4 L 1.3	1.0 K ND 0:067	2.1 ND 0.088	0.52 J 0.36 B	2.4 L 1.4	2.4 L 1.3	2.7 L 1.2	2.6 L 1.3
Sodium Thallium	mg/Kg mg/Kg	4000 0.90	55 ND 0,20	2300 ND 0.26	990 0,26	5600 0.86 J	5200 0.52 J	3400 0.80	4200 0:81
Vanadium Zinc Methyl mercury	mg/Kg mg/Kg	75 440 J	34 50	57 240	35 J 49 J	74 J 410 J	67 J 360 J	61 J 380 J	68 J 400 J
General Chemistry	ug/Kg			••					
Ammonia	mg/Kg	<u>.</u>	22						
Sulfide Coarse gravet (19:0 mm)	mg/Kg %		 		 	 	-		——————————————————————————————————————
Fine gravel (4.75 mm) Coarse sand: (2:00 mm)	% %	 #			 	 	 		
Medium sand (0.425 mm) Fine sand (0.075 mm)	% %		 	•• ••	-			 	
Silts/clays (<0.075 mm) Total organic carbon (TOC)	% mg/Kg	44000 K	5700	12000	6400 K	53000 K	58000 K	34000 J	 37000 J

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION

Page 9 (a)

Date Printed: May 12, 1999

Time Printed: 2:18 pm

DELAWARE CITY, DELAWARE AUGUST 1998 - APRIL 1999

WB-22 Sample Location: WB-23 WB-24 WB-25 WB-26 WB-26 WB-27 WB-27 Sample Depth: 2-4 ft. 4-6 ft. 4-6 ft. 4-6 ft. 0-2 ft. 6-8 ft. 0-2 ft. 6-8 ft. Sample Date: 08/19/1998 08/20/1998 08/24/1998 08/24/1998 08/20/1998 08/20/1998 08/17/1998 08/17/1998 **Parameters** Units TCL Volatiles Chloromethane ND 11 ND 18 ND 15 ND 14 ug/Kg ND 11 ND 17 ND 11 ND 15 Bromomethane ND 11 ug/Kg ND 18 ND 15 ND 14 ND 11 ND 17 ND 11 ND 15 Vinvl chloride ND 18 ND 11 ND 14 ND 17 ug/Kg ND 15 ND 11 ND 11 ND 15 Chlorocthane ND 11 ug/Kg ND 18 ND 15 ND 14 ND 11 ND 17 ND 11 ND 15 Methylene chloride ug/Kg 2 B 2 B 13 B 10 B 6 B 5 B 1 B ND 15 Acetone ug/Kg 24 B 23 ND 11 31 B 35 11 B Carbon disulfide ug/Kg ND 11 ND 18 ND 15 ND 14 ND 17 ND 11 ND 15 ND II 1.1-Dichloroethene ug/Kg ND 11 ND 18 ND 15 ND 14 ND 11 ND 17 ND 11 ND 15 1.1-Dichloroethane ND 11 ug/Kg ND 18 ND 15 ND 14 ND 11 ND 17 ND 11 ND 15 1.2-Dichloroethene (total) ug/Kg ND 11 ND 18 ND 15 ND 14 ND 11 ND 17 ND 11 ND 15 2-Butanone (MEK) ug/Kg ND 11 ND 18 ND 14 ND 17 15 J ND 11 ND 11 ND 15 Chloroform ug/Kg ND 11 ND 14 ND 18 ND 11 ND 15 ND 17 ND 11 ND 15. 1.2-Dichloroethane ug/Kg ND 11 ND 18 ND 15 **ND 14** ND 11 ND 17 ND 11 ND 15 1.1.1-Trichloroethane ug/Kg ND 11 ND 18 ND 15 ND 14 ND 11 ND 17 ND 11 ND 15 Carbon tetrachloride ND 11 ND 18 J ND 15 ug/Kg ND 14 ND 17 ND 11 ND 11 ND 15 Bromodichloromethane ND 11 ug/Kg ND 18 ND 15 ND 14 ND 11 ND 17 ND 11 ND 15 1,2-Dichloropropane ug/Kg ND 11 ND 18 ND 15 ND 14 ND 17 ND 11 ND 11 ND 15 cis-1,3-Dichloropropene ND 11 ug/Kg ND 18 ND 15 ND 14 ND 11 ND 17 ND 11 ND 15 Trichloroethene ug/Kg ND 11 ND 18 ND 15 ND 14 ND 11 ND 17 ND 11 ND 15 Benzene ug/Kg ND 11 ND 18 J ND 15 li J ND 11 ND 17 ND 11 ND 15 Dibromochloromethane ug/Kg ND 11 ND 18 ND 15 ND 14 ND 11 ND 17 ND 11 ND 15 trans-1,3-Dichloropropene ND 11 ND 15 ug/Kg ND 18 ND 14 ND 11 ND 17 ND 11 ND 15 1.1.2-Trichloroethane ND 11 ug/Kg ND 18 ND 15 ND 14 ND 11 ND 17 ND 11 ND 15 Bromoform ug/Kg ND 11 ND 18 J ND 15 ND 14 ND 11 ND 17 ND 11 ND 15. 4-Methyl-2-pentanone (MIBK) ND 11 ug/Kg ND 18 ND 15 ND 14 ND 11 ND 11 ND 17 ND 15 2-Hexanone ND 15 ug/Kg ND 11 ND 18 ND 14 ND 11 ND 17 ND 11 ND 15 Tetrachloroethene ug/Kg 9 B ND 18 2 B 6 B 11 B 18 J 6 B 4 B 1,1,2,2-Tetrachloroethane ND 11 ND II ug/Kg ND 18 ND 15 ND 14 ND II ND 17 ND 15 Toluene ND II ND 18 ND 15 ug/Kg ND 14 ND 11 ND 17 ND 11 ND 15 Chlorobenzene: ug/Kg 3 B 4 B 47 4 B 4 B Ethylbenzene ND 11 ND 18 ND 15 ND 14 ND 11 ND 11 ug/Kg ND 17 ND 15 Styrene ug/Kg ND II ND 18 ND 15 ND 14 ND 11 ND 17 ND 11 ND 15 Xylenes (total) ug/Kg ND 11 ND 18 ND 15 ND 14 ND 11 ND 17 ND 11 ND 15 TCL Semi-volatiles Phenol ND 1800 ND 600 ND 500 J ND 530 J ND 370 ND 580 ND 370 ND 490

33\J:\DBASEGRP\CHEM\7000\7462\5a) Anal - SO/SE - Target Analyses

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION

Page 9 (b)

Date Printed: May 12, 1999

Time Printed: 2:18 pm

DELAWARE CITY, DELAWARE AUGUST 1998 - APRIL 1999

Sample Location: WB-22 WB-23 WB-24 WB-25 WB-26 WB-26 WB-27 WB-27 Sample Depth: 2-4 ft. 4-6 ft. 4-6 ft. 4-6 ft. 0-2 ft. 6-8 ft. 0-2 ft. 6-8 ft. Sample Date: 08/19/1998 08/20/1998 08/24/1998 08/24/1998 08/20/1998 08/20/1998 08/17/1998 08/17/1998 **Parameters** Units TCL Semi-volatiles (Cont'd) Bis(2-chloroethyl)ether ug/Kg ND 560 ND 180 ND 150 J ND 160 J ND 110 ND 170 ND 110 ND 150 2-Chlorophenol ug/Kg ND 1800 ND 600 J ND 500 J ND 530 J ND 370 ND 580 ND 370 ND 490 1.3-Dichlorobenzene ug/Kg ND 1800 ND 600 ND 500 J 150 J 110 J ND 580 ND 370 240 J 1.4-Dichlorobenzene ND 1800 390 J ug/Kg 92 J 1100 J 860 80 J 140 J 390 J 1,2-Dichlorobenzene ug/Kg ND 1800 170 J 79 J 750 J 2100 80 J ND 490 64 J 2-Methylphenol ug/Kg ND 1800 ND 600 ND 500 J ND 530 J ND 370 ND 580 ND 370 ND 490 2,2'-Oxybis(1-chloropropane) ug/Kg ND 1800 ND 600 ND 500 J ND 530 J ND 370 ND 580 ND 370 ND 490 4-Methylphenol ug/Kg ND 1800 130 J 200 J ND 530 J ND 370 180 ND 370 81 N-nitroso-di-n-propylamine ug/Kg ND 1800 ND 600 J ND 500 J ND 580 ND 530 J ND 370 ND 370 ND 490 Hexachloroethane ND 1800 ug/Kg ND 600 ND 500 J ND 530 J ND 370 ND 580 ND 370 ND 490 Nitrobenzene ug/Kg ND 1800 ND 600 ND 500 J ND 530 J ND 370 ND 580 ND 370 ND 490 Isophorone ug/Kg ND 1800 100 ND 500 J ND 530 J ND 370 ND 580 ND 370 ND 490 2-Nitrophenol ug/Kg ND 1800 ND 600 ND 500 J ND 530 J ND 370 ND 580 ND 370 ND 490 2.4-Dimethylphenol ug/Kg ND 1800 ND 600 ND 500 J ND 530 J ND 370 ND 580 ND 370 ND 490 Bis(2-chloroethoxy)methane ug/Kg ND 1800 ND 600 ND 500 J ND 530 J ND 370 ND 580 ND 370 ND 490 2.4-Dichlorophenol ug/Kg ND 1800 ND 600 ND 500 J ND 530 J ND 370 ND 580 ND 370 ND 490 1.2.4-Trichlorobenzene ug/Kg ND 1800 130 J 56 J 280 J 3100 ND 580 82 J 180 J Naphthalene ND 1800 ug/Kg 130 J 220 I 63 J ND 370 220 J ND 370 130 J 4-Chloroaniline ug/Kg ND 1800 ND 600 ND 500 J ND 530 J ND 580 ND 370 ND 370 ND 490 Hexachlorobutadiene ND 1800 ug/Kg ND 600 ND 500 J ND 530 J ND 370 ND 580 ND 370 ND 490 4-Chlore-3-methylphenol ug/Kg ND 1800 ND 600 ND 500 J ND 530 J ND 370 ND 580 ND 370 ND 490 2-Methylnaphthalene ug/Kg ND 1800 88 J 120 J ND 530 J ND 370 1200 ND 370 ND 520 Hexachlorocyclopentadiene ug/Kg ND 1800 ND 600 ND 500 J ND 530 J ND 580 ND 370 ND 370 ND 490 2.4.6-Trichlorophenol ND 500 J ug/Kg ND 1800 ND 600 ND 530 J ND 370 ND 580 ND 370 ND 490 2,4,5-Trichlorophenol ug/Kg ND 4500 ND 1400 ND 1200 J ND 1300 J ND 890 ND 1400 ND 880 ND 1200 2-Chloronaphthalene ug/Kg ND 1800 ND 600 ND 500 J ND 530 J ND 370 ND 580 ND 370 ND 490 2-Nitroaniline ug/Kg ND 3700 ND 1200 ND 990 J ND 1000 J ND 730 ND 1100 ND 720 ND 970 Dimethyl phthalate ug/Kg ND 1800 ND 600 ND 500 J ND 530 J ND 370 ND 580 ND 370 ND 490 Acenaphthylene ND 1800 ug/Kg ND 600 ND 500 J ND 530 J ND 370 ND 580 ND 370 ND 490 2.6-Dinitrotoluene ug/Kg ND 1800 ND 600 ND 500 J ND 530 J ND 370 ND 580 ND 370 ND 490 3-Nitroaniline ND 3700 ug/Kg ND 1200 ND 990 J ND 1000 J ND 730 ND 1100 ND 720 ND 970 Acenaphthene ND 1800 ug/Kg ND 600 ND 500 J ND 530 J ND 370 94 ND 370 59 2,4-Dinitrophenol ND 3700 ug/Kg ND 1200 J ND 990 J ND 1000 J ND 1100 J ND 730 J ND 720 ND 970 4-Nitrophenol ND 3700 ug/Kg ND 1200 ND 990 J ND 1000 J ND 730 ND 1100 ND 720 ND 970 Dibenzofuran ND 1800 ug/Kg ND 600 ND 500 J ND 530 J ND 370 ND 580 ND 370 ND 490 2.4-Dinitrotoluene ug/Kg ND 1800 ND 600 ND 500 J ND 530 J ND 370 ND 580 ND 370 ND 490 Diethyl phthalate ND 1800 ug/Kg ND 600 ND 500 J ND 530 J

ND 370

ND 580

ND 370

ND 490

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION

OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

Page 9 (c)

Date Printed: May 12, 1999

Time Printed: 2:18 pm

AUGUST 1998 - APRIL 1999

Sample Location: WB-22 WB-23 WB-24 WB-25 WB-26 WB-26 WB-27 WB-27 Sample Depth: 2-4 ft. 4-6 ft. 4-6 ft. 4-6 ft. 0-2 ft. 6-8 ft. 0-2 ft. 6-8 ft. Sample Date: 08/19/1998 08/20/1998 08/24/1998 08/24/1998 08/20/1998 08/20/1998 08/17/1998 08/17/1998 **Parameters** Units TCL Semi-volatiles (Cont'd) Fluorene ug/Kg ND 1800 ND 600 53 J ND 530 J ND 370 120 J ND 370 87 J 4-Chlorophenyl phenylether ug/Kg ND 1800 ND 600 ND 500 J ND 530 J ND 370 ND 580 ND 370 ND 490 4-Nitroaniline ND 3700 ug/Kg ND 1200 ND 990 J ND 1000 1 ND 730 ND 1100 ND 720 ND 970 4.6-Dinitro-2-methylphenol ug/Kg ND 3700 ND 1200 ND 990 J ND 1000 J ND 730 ND 1100 ND 720 ND 970 N-nitrosodiphenylamine ND 1800 ND 600 ug/Kg 60 J ND 530 J ND 370 ND 580 ND 370 ND 490 4-Bromophenyl phenylether ug/Kg ND 1800 ND 600 ND 500 J ND 530 J ND 370 ND 580 ND 370 ND 490 Pentachiorophenol ND 3700 ND 1200 ND 990 J ug/Kg ND 1000 J ND 730 ND 1100 ND 720 ND 970 Phenanthrene ND 1800 ug/Kg 180 J 81 J 56 1 ND 370 450 ND 370 260 J Anthracene ug/Kg ND 1800 ND 600 100 J ND 530 J ND 370 100 J ND 370 54 J Carbazole ND 1800 ug/Kg ND 600 ND 500 J ND 370 ND 530 J ND 580 ND 370 ND 490 Di-n-butyl phthalate ND 1800 ND 600 ND 530 J ug/Kg ND 500 J ND 370 ND 580 ND 370 ND 490 Fluoranthene ND 1800 ug/Kg 85 J 180 J 64 J ND 370 210 J ND 370 130 J Pyrene ND 1800 99] ug/Kg 250 J 87 J ND 370 310 J ND 370 220 J Butylbenzylphthalate ND 1800 ug/Kg ND 600 ND 500 J 280 J ND 370 ND 580 49 J ND 490 Benzo(a)anthracene ug/Kg ND 1800 ND 600 150 J ND 530 J ND 370 120 ND 370 94 3,3'-Dichlorobenzidine ND 600 ug/Kg ND 1800 ND 500 J ND 530 J ND 370 ND 580 ND 370 ND 490 Chrysene ug/Kg ND 1800 69 170 J 58 J ND 370 180 J ND 370 110 J Bis(2-ethylhexyl)phthalate ug/Kg 300000 ND 600 ND 500 J 580 B 250 B 330 B 220 J 1300 Di-n-octyl phthalate 3800 ND 600 ug/Kg ND 500 J ND 530 J ND 370 ND 580 ND 370 ND 490 Benzo(b)fluoranthene ug/Kg ND 1800 ND 600 130 J ND 530 J ND 370 91 J ND 370 56 J Benzo(k)fluoranthene ug/Kg ND 1800 ND 600 110 J ND 530 J ND 370 90 J ND 370 62 J Benzo(a)pyrene ND 1800 ug/Kg ND 600 130 J ND 530 J ND 370 110 J ND 370 190 J Indeno(1,2,3-cd)pyrene ND 1800 130 J ug/Kg ND 600 ND 530 J ND 370 73 J ND 370 52 3 Dibenz(a,h)anthracene ND 1800 ND 600 ug/Kg 64 J ND 530 J ND 370 ND 580 ND 370 ND 490 Benzo(g,h,i)perylene ND 1800 ND 600 ug/Kg 180 J 55 J ND 370 94 J ND 370 70 J 1,2-Diphenyl-hydrazine ND 1800 ug/Kg ND 600 ND 500 J ND 530 J ND 370 ND 580 ND 370 ND 490 Hexachlorobenzene ug/Kg ND 1800 ND 600 ND 500 J ND 530 J 70 J ND 490 ND 580 ND 370 TAL Metals Aluminum mg/Kg 7000 J 15000 J 13000 J 9100 J 6300 J 14000 J 13000 19000 Antimony mg/Kg R 1.7 L 1.1 L 0.73 L R 1.2 L 0.59 1 2.7 L Arsenic mg/Kg 3.8 J 22 J 20 J 9,9 J 2.9 J 25 J 27 6.1 Barium mg/Kg 39 80 68 110 310 69 72 72 Beryllium mg/Kg 0.41 1.4 1.2 0.68 0.38 1,4 0.83 1.5 Cadmium ND 0.034 mg/Kg 0.88 0.51 0.12 ND 0.034 0.77 0.55 1.3

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 9 (d)

Date Printed: May 12, 1999

Sample Location: Sample Depth: Sample Date:		WB-22 2-4 ft. 08/19/1998	WB-23 4-6 ft. 08/20/1998	WB-24 4-6 ft. <u>08/24</u> /1998	WB-25 4-6 ft. _08/24/1998	WB-26 0-2 ft. 08/20/1998	WB-26 6-8 ft. 08/20/1998	WB-27 0-2 ft. 08/17/1998	WB-27 6-8 ft. 08/17/1998
Parameters	<u>Units</u>								
TAL Metals (Cont'd)									
Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Mercury Nickel Potassium Selenium Silver Sodium	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	880 J 20 J 5.4 8.5 15000 J 9.9 JL 1400 J 330 J 9.6 L 8.0 J 820 0.44 J 0.33 B	2500 J 93 J 15 74 34000 J 150 JL 5300 J 1200 J 5.6 29 J 2500 2.7 L 1.5	2000 J 82 J 14 63 31000 J 120 JL 4500 J 820 J 0.82 26 J 3100 2:1 L 1.3	1800 J 41 J 11 24 19000 J 62 JL 2800 J 740 I 1.3 18 J 2500 1.3 B 0.64	700 J 14 J 4.4 7.0 11000 J 14 JL 960 J 170 J 9.2 6.8 J 530 0.56 B 0.27 B	2700 J 87 J 20 68 33000 J 140 JL 5500 J 1300 J 1.6 133 J 2300 3.0 L 1.4	1900 29 8.5 18 27000 22 1900 630 37 J 14 1500 1.3 ND 0.067	2800 90 20 68 35000 150 5900 1100 4.3 J 33 3500 3.11 ND 0.090 3300
Thallium Vanadium Zinc Methyl mercury General Chemistry	mg/Kg mg/Kg mg/Kg mg/Kg ug/Kg	ND 0.20 23 J 37 J =	0.77 65 J 340 J	0.71 56 J 330 J	ND 0.29 37 J 140 J	0.20 18 I 32 J	1.0 62 J 390 J	ND 0.20 34 94	ND 0.27 71 380
Ammonia Sulfide Coarse gravel (19.0 mm) Fine gravel (4.75 mm) Coarse sand (2.00 mm) Medium sand (0.425 mm) Fine sand (0.075 mm) Silts/clays (<0.075 mm) Total organic carbon (TOC)	mg/Kg mg/Kg % % % % % % mg/Kg	5900 K	56000 K	43000 J		7000 K	54000 K	1900	31000 L

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION

OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 10 (a)

Date Printed: May 12, 1999

Time Printed: 2:18 pm

Sample Location:		WB-28	WB-28	WB-29	WB-29	WB-30	WB-30	WB-31	WB-31
Sample Depth:		0-2 ft.	4-6 ft.'	0-2 ft.	4-6 ft.	0-2 ft.	4-6 ft.	0-2 ft.	2-4 ft.
Sample Date:		08/17/1998	08/17/1998	08/17/1998	_08/17/1998_	08/14/1998	08/14/1998	08/14/1998	08/14/1998
Parameters	<u>Units</u>								
TCL Volatiles									
Chiloromethane	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND 11
Bromomethane	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND 11
Vinyl chtoride Chloroethane	ug/Kg	ND II	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND 11
Methylene chloride	ug/Kg ug/Kg	ND 11 1 B	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND 11
Acetone	ug/Kg ug/Kg	ND 11	2 B 38 B	I B	3 B	2 B	2 B	l B	2 B
Carbon disulfide	ug/Kg	ND 11	ND 17	9 B ND II	33 B ND 13	ND 11	33 B	9 В	25 B
1,1-Dichloroethene	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11 ND 11	ND 12 ND 12	ND 11	ND 11
1,1-Dichloroethane	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11	ND 12 ND 12	ND 11 ND 11	ND 11 ND 11
1,2-Dichloroethene (total)	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND 11
2-Butanone (MEK)	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11	8.1	NDÎÎ	ND ÎI
Chloroform	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND 11
1,2-Dichloroethane	ug/Kg	ND II	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND II
1,1,1-Trichloroethane	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND 11
Carbon tetrachloride Bromodichloromethane	ug/Kg	ND 11	ND 17	ND II	ND 13	ND 11	ND 12	ND 11	ND 11
1,2-Dichloropropane	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND 11
cis-1,3-Dichloropropene	ug/Kg	ND 11	ND 17	NDII	ND 13	ND II	ND 12	ND (1	ND 11
Trichloroethene	ug/Kg ug/Kg	ND 11 ND 11	ND 17 ND 17	ND 11 ND 11	ND 13	ND 11	ND 12	ND 11	ND 11
Benzene	ug/Kg	ND 11	ND 17	ND 11	ND 13 ND 13	ND II	ND 12	ND II	ND II
Dibromochloromethane	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11 ND 11	ND 12	ND 11	ND 11
trans-1,3-Dichloropropene	ug/Kg	ND 11	ND 17	ND 11	ND 13 ND 13	ND 11 ND 11	ND 12 ND 12	ND 11	ND II
1,1,2-Trichtoroethane	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND II	ND 12 ND 12	ND 11 ND 11	ND 11
Bromoform	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND 11 ND 11
4-Methyl-2-pentanone (MIBK)	ug/Kg	ND 11	ND 17	ND H	ND 13	ND II	ND 12	ND 11	ND 11
2-Нехаполе	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND 11
Tetrachloroethene	ug/Kg	7 B	5 B	8 8	8 B	10 B	10 B	5 B	8 B
1,1,2,2-Tetrachloroethane	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND 11
Toluene	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11	ND 12	ND II	ND II
Chlorobenzene	ug/Kg	ND 11			3 J	ND 11	3 J	ND 11	4 J
Ethylbenzene	ug/Kg	ND 11	ND 17	NDII	ND 13	ND 11	ND 12	ND 11	ND 11
Styrene Xylenes (total)	ug/Kg ug/Kg	ND 11 ND 11	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND 11
and among the party	nBurk	MD 11	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND 11
TCL Semi-volatiles									
Phenol	ug/Kg	ND 360	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
		•					•		

37U:\DBASEGRP\CHEM\7000\7462\5a) Anal - SO/SE - Target Analyses

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 10 (a)

Date Printed: May 12, 1999

Time Printed: 2:18 pm

Sample Location:		WB-28	WB-28	WB-29	WB-29	WB-30	WB-30	WB-31	WB-31
Sample Depth:		0-2 ft.	4-6 ft.	0-2 ft.	4-6 ft.	0-2 ft.	4-6 ft.	0-2 ft.	2-4 ft.
Sample Date:		08/17/1998	_08/17/1998	08/17/1998	08/17/1998	08/14/1998	08/14/1998	08/14/1998	08/14/1998
						-	•		
Parameters	<u>Units</u>								
TCL Volatiles									
Chloromethane	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11	ND 12	ND II	ND 11
Bromomethane	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND 11
Vinyl chloride	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND 11
Chloroethane	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND 11
Methylene chloride Acetone	ug/Kg ug/Kg	1 B ND 11	2 B	Į B	3 B	2 B	2 B	1 B	2 B
Carbon disulfide	ug/Kg	ND II	38 B ND 17	9 B ND 11	33 B ND 13	ND 11	33 B	9 В	25 B
1.1-Dichloroethene	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11 ND 11	ND 12	ND II	ND 11
1.1-Dichforoethane	ug/Kg	ND II	ND 17	ND 11	ND 13	ND II	ND 12 ND 12	ND 11 ND 11	ND 11 ND 11
1,2-Dichloroethene (total)	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND 11
2-Butanone (MEK)	ug/Kg	ND II	ND 17	ND II	ND 13	ND II	8.1	ND 11	ND II
Chloroform	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND 11
1,2-Dichloroethane	ug/Kg	ND II	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND II
1,1,1-Trichloroethane	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND 11
Carbon tetrachloride Bromodichloromethane	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND II	ND 12	ND 11	ND 11
1,2-Dichloropropane	ug/Kg	ND 11 ND 11	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND 11
cis-1,3-Dichloropropene	ug/Kg ug/Kg	ND 11	ND 17	ND II	ND 13	ND II	ND 12	ND 11	ND 11
Trichlorgethene	ug/Kg	ND 11	ND 17 ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND 11
Benzene	ug/Kg	ND 11	ND 17	ND 11 ND 11	ND 13 ND 13	ND 11 ND 11	ND 12	ND 11	ND II
Dibromochloromethane	ug/Kg	ND 11	ND 17	ND II	ND 13	ND 11	ND 12	ND 11	ND 11
trans-1,3-Dichloropropene	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11	ND 12 ND 12	ND 11 ND 11	ND 11 ND 11
1,1,2-Trichtoroethane	ug/Kg	ND II	ND 17	ND i i	ND 13	ND II	ND 12	ND II	(00000000000000000000000000000000000000
Bromoform	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND 11 ND 11
4-Methyl-2-pentanone (MIBK)	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11	ND 12	ND II	ND 11
2-Hexanone	ug/Kg	ND 11	ND 17	ND II	ND 13	ND 11	ND 12	ND 11	ND 11
Tetrachloroethene	ug/Kg	7 B	5 B	8 B	8 B	10 B	10 B	5°B	8 B
1,1,2,2-Tetrachloroethane	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND 11
Toluene Chlorobenzene	ug/Kg	ND 11	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND II
Ethylbenzene	ug/Kg	ND 11 ND 11	4 J	i j	3 J	ND 11	3 J	ND 11	4 J
Styrene	ug/Kg ug/Kg	ND 11	ND 17	NO 11	ND 13	ND 11	ND 12	ND 11	ND 11
Xylenes (total)	ug/Kg ug/Kg	ND II	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND 11
	uping	111111	ND 17	ND 11	ND 13	ND 11	ND 12	ND 11	ND 11
TCL Semi-volatiles									
Phenot	ug/Kg	ND 360	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
37U:\DBASEGRP\CHEM\7000\7462\5a) Anal - SO/SE -	Target Analyses 05/1	0/99							

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

Time Printed: 2:18 pm

Date Printed: May 12, 1999

Page 10 (b)

AUGUST 1998 - APRIL 1999

Sample Location:		WB-28	WB-28	WB-29	WB-29	WB-30	WB-30	WB-31	WB-31
Sample Depth:		0-2 ft.	4-6 ft.	0-2 ft.	4-6 ft.	0-2 ft.	4-6 ft.	0-2 ft.	2-4 ft.
Sample Date:		08/17/1998	08/17/1998	08/17/1998	08/17/1998	08/14/1998	08/14/1998	08/14/1998	08/14/1998
ounpo solo.		00/1//1998	00/1//1990	00/1//1990	08/1//1998	00/14/1998	08/14/1998	00/14/1998	
<u>Parameters</u>	<u>Units</u>								
TCL Semi-volatiles (Cont'd)									
Bis(2-chloroethyl)ether	ug/Kg	ND 110	ND 170	ND 110	ND 130	ND 110	ND 120	ND 110	ND 110
2-Chlorophenol	ug/Kg	ND 360	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
1,3-Dichlorobenzene	ug/Kg	ND 360	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	57 J
1,4-Dichlorobenzene	ug/Kg	87 J	110 J	61 J	79 J	ND 370	ND 390	110 J	260 J
1,2-Dichlorobenzene 2-Methylphenol	ug/Kg	140 J ND 360	ND 560	73 J	ND 430	ND 370	ND 390	90 J	160 J
2.2'-Oxybis(1-chloropropane)	ug/Kg ug/Kg	ND 360	ND 560 ND 560	ND 360 ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
4-Methylphenol	ug/Kg	ND 360	ND 360 94 J	ND 360	ND 430 ND 430	ND 370 ND 370	ND 390 ND 390	ND 370 ND 370	ND 380
N-nitroso-di-n-propylamine	ug/Kg	ND 360	ND 560	ND 360	ND 430 ND 430	ND 370	ND 390	ND 370	ND 380 ND 380
Hexachloroethane	ug/Kg	ND 360	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
Nitrobenzene	ug/Kg	ND 360	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
Isophorone	ug/Kg	ND 360	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
2-Nitrophenol	ug/Kg	ND 360	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
2,4-Dimethylphenol	ug/Kg	ND 360	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
Bis(2-chloroethoxy)methane	ug/Kg	ND 360	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
2,4-Dichlorophenol 1,2,4-Trichlorobenzene	ug/Kg	ND 360	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	_ND 380
Naphthalene	ug/Kg	230 J ND 360	120 J 110 J	80 J	ND 430	ND 370	ND 390	110 J	170 J
4-Chloroaniline	ug/Kg ug/Kg	ND 360	ND 560	ND 360 ND 360	ND 430 ND 430	ND 370 ND 370	ND 390	ND 370	ND 380
Hexachlorobutadiene	ug/Kg	ND 360	ND 560	ND 360	ND 430 ND 430	ND 370	ND 390 ND 390	ND 370 ND 370	ND 380 ND 380
4-Chloro-3-methylphenol	ug/Kg	ND 360	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
2-Methylnaphthalene	ug/Kg	ND 360	62 J	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
Hexachlorocyclopentadiene	ug/Kg	ND 360	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
2,4,6-Trichlorophenol	ug/Kg	ND 360	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
2,4,5-Trichlorophenol	ug/Kg	ND 870	ND 1400	ND 870	ND 1000	ND 880	ND 940	ND 900	ND 910
2-Chloronaphthalene	ug/Kg	ND 360	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
2-Nitroaniline	ug/Kg	ND 710	ND 1100	ND 720	ND 850	ND 720	ND 770	ND 730	ND 750
Dimethyl phthalate	ug/Kg	ND 360	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
Acenaphthylene 2,6-Dinitrotoluene	ug/Kg	ND 360 ND 360	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
3-Nitroaniline	ug/Kg ug/Kg	ND 300 ND 710	ND 560 ND 1100	ND 360 ND 720	ND 430	ND 370	ND 390	ND 370	ND 380
Acenaphthene	ug/Kg	ND 360	ND 560	ND 720 ND 360	ND 850 ND 430	ND 720 ND 370	ND 770 ND 390	ND 730	ND 750
2,4-Dinitrophengl	ug/Kg	ND 710	ND 1100	ND 720	ND 850	ND 720	ND 770	ND 370 ND 730	ND 380 ND 750
4-Nitrophenol	ug/Kg	ND 710	ND 1100	ND 720	ND 850	ND 720 ND 720	ND 770	ND 730 ND 730	ND 750 ND 750
Dibenzofuran	ug/Kg	ND 160	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
2,4-Dinitrotoluene	ug/Kg	ND 360	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
Diethyl phthalate	ug/Kg	ND 360	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
,,			· · · · · · · · · · · · · · · · · · ·	ries estimateur automatica (1985)			www.wincoward.ip.org/19090	on production areas consistents	a francisco en la constanta de la constanta de la constanta de la constanta de la constanta de la constanta de

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES

PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 10 (c)

Date Printed: May 12, 1999

Sample Location: Sample Depth:		WB-28 0-2 ft.	WB-28 4-6 ft.	WB-29 0-2 ft.	WB-29 4-6 (t.	WB-30	WB-30	WB-31	WB-31
Sample Date:		08/17/1998				0-2 ft.	4-6 ft.	0-2 ft.	2-4 ft.
vanipie vota.		00/1//1998	08/17/1998	_08/17/1998_	08/17/1998	08/14/1998	08/14/1998	08/14/1998	08/14/1998
Parameters	<u>Units</u>								
TCL Semi-volatiles (Cont'd)									
Fluorene	ug/Kg	ND 360	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
4-Chlorophenyl phenylether	ug/Kg	ND 360	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
4-Nitroaniline 4,6-Dinitro-2-methylphenol	ug/Kg	ND 710	ND 1100	ND 720	ND 850	ND 720	ND 770	ND 730	ND 750
N-nitrosodiphenylamine	ug/Kg ug/Kg	ND 710 ND 360	ND 1100	ND 720	ND 850	ND 720	ND 770	ND 730	ND 750
4-Bromophenyl phenylether	ug/Kg	ND 360	ND 560 ND 560	ND 360 ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
Pentachlorophenol	ug/Kg	ND 710	ND 1100	ND 720	ND 430 ND 850	ND 370 ND 720	ND 390 ND 770	ND 370 ND 730	ND 380
Phenanthrene	ug/Kg	40 J	100 1	ND 360	ND 430	ND 720 ND 370	ND 770 ND 390	ND 730 ND 370	ND 750 ND 380
Anthracene	ug/Kg	ND 360	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380 ND 380
Carbazole	ug/Kg	ND 360	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
Di-n-butyl phthalate	ug/Kg	ND 360	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
Fluoranthene Pyrene	ug/Kg	68 J	96 J	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
Butylbenzylphthalate	ug/Kg ug/Kg	78 J 260 J	130 J	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
Benzo(a)anthracene	ug/Kg	200 J - 47 J	ND 560 74 J	ND 360 ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
3,3 -Dichlorobenziding	ug/Kg	ND 360	ND 560	ND 360	ND 430 ND 430	ND 370 ND 370	ND 390 ND 390	ND 370	ND 380
Chrysene	ug/Kg	56 J	100 J	ND 360	ND 430	ND 370 ND 370	ND 390	ND 370 ND 370	ND 380 ND 380
Bis(2-ethylhexyl)phthalate	ug/Kg	ND 360	420)	150 J	ND 430	ND 370	170 J	160 1	240 J
Di-n-octyl phthalate	ug/Kg	ND 360	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
Benzo(b)fluoranthene	ug/Kg	65 1	82 J	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
Benzo(k)fluoranthene	ug/Kg	46 J	71 J	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
Benzo(a)pyrene Indeno(1,2,3-cd)pyrene	ug/Kg	49 J	330 J	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
Dibenz(a,h)anthracene	ug/Kg	39 J	71]	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
Benzo(g,h,i)perylene	ug/Kg ug/Kg	ND 360 43 J	ND 560 99 J	ND 360 ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
1,2-Diphenyl-hydrazine	ug/Kg	ND 360	ND 560	ND 360	ND 430 ND 430	ND 370 ND 370	ND 390 ND 390	ND 330	ND 380
44 5 444 CO. 14 4 CO. 14 C. \$14 CO. 1			······································	11 D 300	110 430	, nu 310	Dec du	ND 370	ND 380
Hexachlorobenzene	ug/Kg	59 J	ND 560	ND 360	ND 430	ND 370	ND 390	ND 370	ND 380
TAL Metals									
. (1/10) 1/10) 1/10/10/10/10/10/10/10/10/10/10/10/10/10		antonii aanona aana aana	heaters						
Aluminum	mg/Kg	12000	23000	11000	12000	11000	13000	14000	14000
Antimony Arsenic	mg/Kg	0.61 L	2.3 L	0.38 L	0.57 L	0.42 L	0.54 L	0.54 L	0.79 L
Arsenic Barium	mg/Kg	3,9	19	3.2	7.9	2.4	3.9	5.0	3.9
Beryllium	mg/Kg mg/Kg	64 0.43	73	61	43	33	37	60	76
Cadmium	mg/Kg	0,62 0,21	1.4	0,57	0.70	0.39	0.58	0.57	0.55
	ing/rig	0.21	1.1	0.21	0.45	0.15	0.23	0.30	0.29

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION

OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 10 (d)
Date Printed: May 12, 1999

Sample Location: Sample Depth: Sample Dete:		WB-28 0-2 ft. 08/17/1998	WB-28 4-6 ft. 08/17/1998	WB-29 0-2 ft. 08/17/1998	WB-29 4-6 ft. 08/17/1998	WB-30 0-2 ft. 08/14/1998	WB-30 4-6 ft. 08/14/1998	WB-31 0-2 ft. 08/14/1998	WB-31 2-4 ft. 08/14/1998
<u>Parameters</u>	Units								
TAL Metals (Cont'd)									
Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Mercury Nickel Potassium Selenium Silver Sodium Thallium Vanadium Zinc Methyl mercury General Chemistry	mg/Kg mg/Kg	490 18 6.4 9.4 17000 17 1400 1.8 J 9.0 260 0.80 K ND 0.066 160 ND 0.19 29 36	3900 87 21 43 37000 110 7800 1200 12 J 36 5600 2.8 ND 0.10 2100 ND 0.30 75 260	720 16 5.6 9.0 13000 11 870 99 3.2 J 7.9 800 0.48 K ND 0.066 43 ND 0.20 24 37	2400 38 11 13 22000 20 4300 580 2.5 J 18 2500 0.97 K ND 0.079 370 ND 0.23 31 100	740 14 3,7 5,3 8800 7,4 740 66 1117 5,5 440 ND 0,22 ND 0,067 80 ND 0,20 20	520 23 4.8 11 9200 25 1400 210 2.3 J 8.7 1000 0.73 K ND 0.071 850 ND 0.21 28	880 24 7.0 9.2 17000 14 1700 220 4.7 J 11 1000 0.69 K ND 0.68 760 ND 0.20 33	940 24 7.0 10 16000 14 1700 190 7.8 J 10 1400 0.89 K ND 0.069 920 ND 0.20 33 39
Ammonia Sulfide Coarse gravel (19.0 mm) Fine gravel (4.75 mm) Coarse sand (2.00 mm) Medium sand (0.425 mm) Fine sand (0.075 mm) Silts/clays (<0.075 mm) Total organic carbon (TOC)	mg/Kg mg/Kg % % % % % % mg/Kg	3800 L	28000 L	2600°L		4900 L	4600°L		5400 L

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE AUGUST 1998 - APRIL 1999

Page 11 (a)

Date Printed: May 12, 1999 Time Printed: 2:18 pm

Sample Depth:		0-2 ft.	4-6 ft.	
Sample Date:		08/17/1998	08/17/1998	,
Parameters	<u>Units</u>			
TO I I I I				
TCL Volatiles				
Chloromethane	ug/Kg	ND 11	ND 17	
Bromomethane Vinyl chloride	ug/Kg ug/Kg	ND 11 ND 11	ND 17	
Chloroethane	ug/Kg ug/Kg	ND II	ND 17 ND 17	
Methylene chloride	ug/Kg	2 B	2 B	
Acetone Carbon disulfide	ug/Kg	ND II	37 B	
1 1-Dichloroethene	ug/Kg ug/Kg	ND 11 ND 11	ND 17 ND 17	
1,1-Dichloroethane	ug/Kg	ND II	ND 17	
1,2-Dichloroethene (total) 2-Butanone (MEK)	ug/Kg	ND 11	ND 17	
Chloroform	ug/Kg ug/Kg	ND 11 ND 11	ND 17 ND 17	
1,2-Dichloroethane	ug/Kg	ND 11	ND 17	
1,1,1-Trichloroethane Carbon tetrachloride	ug/Kg	ND 11	ND 17	
Bromodichloromethane	ug/Kg ug/Kg	ND 11 ND 11	ND 17	
1,2-Dichloropropane	ug/Kg	ND 11	ND 17 ND 17	
cis-1,3-Dichloropropene	ug/Kg	ND II	ND 17	
Trichloroethene Benzene	ug/Kg	ND 11	ND 17	
Dibromochloromethane	ug/Kg ug/Kg	ND 11 ND 11	ND 17 ND 17	
trans-1,3-Dichloropropene 1,1,2-Trichloroethane	ug/Kg	ND 11	ND 17	
1,1,2-Trichloroethane Bromoform	ug/Kg	ND 11	ND 17	
4-Methyl-2-pentanone (MIBK)	ug/Kg ug/Kg	ND 11 ND 11	ND 17 ND 17	
2-Hexanone	ug/Kg	ND 11	ND 17	
Tetrachloroethene	ug/Kg	7 B	7 B	
1,1,2,2-Tetrachioroethane Toluene	ug/Kg ug/Kg	ND 11	ND 17	
Chlorobenzene	ug/Kg	ND 11 ND 11	ND 17 10-1	
Ethylbenzene	ug/Kg	ND 11	ND 17	
Styrene Xylenes (total)	ug/Kg	ND II	ND 17	
and total	ug/Kg	ND 11	ND 17	

TCL Semi-volatiles

Sample Location:

WB-32

WB-32

ND 560

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE AUGUST 1998 - APRIL 1999

Page 11 (b)

Date Printed: May 12, 1999 Time Printed: 2:18 pm

Sample Location:		WB-32	WB-32	
Sample Depth:		0-2 ft.	4-6 ft.	
Sample Date:		08/17/1998		
		<u></u>	08/17/1998	
<u>Parameters</u>	Units			•
TCL Semi-volatiles (Cont'd)				
Bis(2-chloroethyl)ether	ug/Kg	ND 110	ND 170	
2-Chlorophenol	ug/Kg	ND 350	ND 560	
1,3-Dichlorobenzene	ug/Kg	ND 350	87 J	
1,4-Dichlorobenzene	ug/Kg	ND 350	430 J	
1,2-Dichlorobenzene 2-Methylphenol	ug/Kg	ND 350	ND 560	
2,2'-Oxybis(1-chloropropane)	ug/Kg	ND 350	ND 560	
4-Methylphenol	ug/Kg	ND 350	ND 560	
N-nitroso-di-n-propylamine	ug/Kg ug/Kg	ND 350 ND 350	74]	
Hexachloroethane	ug/Kg	ND 350	ND 560 ND 560	
Nitrobenzene	ug/Kg	ND 350	ND 560	
Isophorone	ug/Kg	ND 350	ND 360 ND 360	
2-Nitrophenol	ug/Kg	ND 350	ND 560	
2,4-Dimethylphenol	ug/Kg	ND 350	ND 560	
Bis(2-chloroethoxy)methane	ug/Kg	ND 350	ND 560	
2,4-Dichlorophenol	ug/Kg	ND 350	ND 560	
1,2,4-Trichlorobenzene	ug/Kg	ND 350	ND 560	
Naphthalene 4-Chloroaniline	ug/Kg	ND 350	91 J	
Hexachlorobutadiene	ug/Kg	ND 350 _	ND 560	
4-Chloro-3-methylphenoi	ug/Kg	ND 350	ND 560	
2-Methylnaphthalene	ug/Kg ug/Kg	ND 350 ND 350	ND 560 ND 560	
Hexachlorocyclopentadiene	ug/Kg	ND 350	ND 560 ND 560	
2,4,6-Trichlorophenol	ug/Kg	ND 350	ND 560	
2,4,5-Trichlorophenol	ug/Kg	ND 850	ND 1300	
2-Chloronaphthalene	ug/Kg	ND 350	ND 560	
2-Nitroaniline	ug/Kg	ND 700	ND 1100	
Directly I pluhalate	ug/Kg	ND 350	ND 560	
Acenaphthylene 2;6-Dimitrotoluene	ug/Kg	ND 350	ND 560	
2:0-Dinkrotomene 3-Nitroaniline	ug/Kg	ND 350	ND 560	
Acenaphthene	ug/Kg	ND 700	ND 1100	
2,4-Dinitrophenol	ug/Kg	ND 350	ND 560	
4-Nitrophenol	ug/Kg	ND 700	ND 1100	
Dibenzofuran	ug/Kg	ND 700	ND 1100	
2,4-Dinitrofoluene	ug/Kg ug/Kg	ND 350	ND 560	
Diethyl phthalate	us/V ~	ND 350	ND 560	

Diethyl phthalate

ND 350

ND 560

ug/Kg

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE AUGUST 1998 - APRIL 1999

Page 11 (c)

Date Printed: May 12, 1999

Time Printed: 2:18 pm

Sample Location:		WB-32	WB-32	
Sample Depth:		0-2 ft.	4-6 ft.	
Sample Date:		08/17/1998	08/17/1998	
•		00/1//1990	_00/1//1398	• • • • • • • • • • • • • • • • • • •
<u>Parameters</u>	<u>Units</u>			
TCL Semi-volatiles (Cont'd)				
Fluorene	ug/Kg	ND 350	ND 560	
4-Chlorophenyl phenylether	ug/Kg	ND 350	ND 560	
4-Nitroaniline	ug/Kg	ND 700	ND 1100	
4,6-Dinitro-2-methylphenol N-nitrosodiphenylamine	ug/Kg	ND 700	ND 1100	
4-Bromophenyl phenylether	ug/Kg ug/Kg	ND 350 ND 350	ND 560	
Pentachlorophenol	ug/Kg	ND 700	ND 560 ND 1100	
Phenanthrene	ug/Kg	79 J	84 J	
Anthracene	ug/Kg	ND 350	ND 560	
Carbazole	ug/Kg	ND 350	ND 560	
Di-n-butyl phthalate Fluoranthene	ug/Kg	ND 350	ND 560	
Pyrene	ug/Kg ug/Kg	90 J 110 J	110 J	
Butylbenzylphthalate	ug/Kg	ND 350	120 J ND 560	
Benzo(a)anthracene	ug/Kg	57 J	ND 300 75 J	
3,3'-Dichlorobenzidine	ug/Kg	ND 350	ND 560	
Chrysene	ug/Kg	59 J	78 J	
Bis(2-ethylhexyl)phthalate Di-n-octyl phthalate	ug/Kg	280 J	400 J	
Benzo(b)fluoranthene	ug/Kg	ND 350	ND 560	
Benzo(k)fluoranthene	ug/Kg ug/Kg	ND 350 ND 350	64 J 67 J	
Benzo(a)pyrene	ug/Kg	48 J	160 J	
Indeno(1,2,3-cd)pyrene	ug/Kg	45 J	72 j	
Dibenz(a,h)anthracene	ug/Kg	ND 350	ND 560	·
Benzo(g,h,i)perylene 1,2-Diphenyl-hydrazine	ug/Kg	62 1	87 J	
1,2-Diphenyr-nydrazine	ug/Kg	ND 350	ND 560	
Hexachlorobenzene	ug/Kg	620	ND 560	
-		949	NUJOV	
TAL Metals	1			
Aluminum				
Antimony	mg/Kg	9100	21000	
Arsenic	mg/Kg mg/Kg	0.59 L	2.0 L	
Barium	mg/Kg	1.7 K 410	21 100	
Beryllium	mg/Kg	0.50	1.2	
Cadmium	mg/Kg	0.29	i. 3	
		ennyegest tittasia in mattasia ili ili ili ili ili ili ili ili ili i		

43\J:\DBASEGRP\CHEM\7000\7462\5a) Anai - SO/SE - Target Analyses

ANALYTICAL RESULTS SUMMARY - SOIL/SEDIMENT SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE AUGUST 1998 - APRIL 1999

Page 11 (d)

Date Printed: May 12, 1999

Sample Location:		WB-32	WB-32	
Sample Depth:		0-2 ft.	4-6 ft.	
Sample Date:				
-		08/17/1998	08/17/1998	
Parameters				
raidificies	<u>Units</u>			
TAL Metals (Cont'd)	1			
Calcium	mg/Kg	4000	3000	
Chromium Cobalt	mg/Kg	14	78	
Copper	mg/Kg	3.6	19	
Iron	mg/Kg mg/Kg	18	48	
Lead	mg/Kg	9300 19	34000 88	
Magnesium	mg/Kg	1400	6000	
Manganese	mg/Kg	100	.980	
Mercury Nickel	mg/Kg	34 J	17 J	
Potassium	mg/Kg	10	31	
Selenium	mg/Kg mg/Kg	710	5400	
Silver	mg/Kg	0.55 K ND 0.065	2.5 ND 0.10	
Sodium	mg/Kg	340	5700	
Thallium	mg/Kg	ND 0.19	ND 0.30	
Vanadium Zinc	mg/Kg	18	64	
Methyl mercury	mg/Kg	150	290	
	ug/Kg	**		
General Chemistry				
A				
Ammonia Sulfide	mg/Kg	Microsoft State Andrews State		
Coarse gravel (19.0 mm)	mg/Kg	-		
Fine gravel (4.75 mm)	% %	·	FREE CONTRACTOR OF THE CONTRAC	
Coarse sand (2.00 mm)	%		***	
Medium sand (0.425 mm)	% %			
Fine sand (0.075 mm)	% %			
Silts/clays (<0.075 mm) Total organic carbon (TOC)		-	·	
Toma organic cattoon (TOC)	mg/Kg	6000 L	33000 L	

<u>Notes</u>

NDx - Estimated.

- Not detected at or above x.

Dupl,

- Field duplicate.

R - Rejected.

K

- Value is estimated indicating a potential high bias.

- Value is estimated indicating a potential low bias.

В

- Analyte was present in an associated blank, indicating probable contamination.

- Not applicable.

ANALYTICAL RESULTS SUMMARY - PIEZOMETER SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION

DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 1 (a)

Date Printed: May 12, 1999

Sample Location:		PZ-2	PZ-2 Dupl.	PZ-3	PZ-4	PZ-5	PZ-6	PZ-7	PZ-8
Parameters	<u>Units</u>								
TCL Volatiles									
Chloromethane Bromomethane	ug/L ug/L	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10	ND 10
Vinyl chloride	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10
Chlorgethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Methylene chloride	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Acetone	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Carbon disulfide	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
1,1-Dichloroethene	ug/L	ND 10	ND 10	ND 10	ND:10	ND 10	ND 10	ND 10	ND 10
1,1-Dichloroethane 1,2-Dichloroethene (total)	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
2-Butanone (MEK)	ug/L	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10 ND 10	ND 10	01 DM	ND 10	ND 10
Chloroform	ug/L ug/L	ND 10	ND 10	ND 10 ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10
1,2-Dichloroethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10
1,1,1-Trichloroethane	ug/L	ND IO	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Carbon tetrachloride	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Bromodichloromethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
1,2-Dichloropropane	l ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
cis-1,3-Dichloropropene	ug/L	ND 10	ND 10	ND 10	01 GM	ND 10	ND 10	ND 10	ND 10
Trichloroethene Benzene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Dibromochloromethane	ug/L	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
trans-1,3-Dichloropropene	ug/L ug/L	01 DN	01 DN	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10
1,1,2-Trichloroethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10
Bromoform	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	NDio	ND 10
4-Methyl-2-pentanone (MIBK)	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
2-Hexanone	ug/L	ND 10	ND 10	ND 10	ND 10	× ND 10	ND 10	ND 10	ND 10
Tetrachloroethene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
1,1,2,2-Tetrachloroethane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Toluene Chlorobenzene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Ethylbenzene	ug/L	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Stytene	ug/L ug/L	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10	ND 10	ND 10
Xylenes (total)	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10
,,		112 10	112 10	ND 10	ND IV	ND IO	ND IO	ND 10	ND 10
TCL Semi-volatiles									
Phonol	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Bis(2-chloroethyl)ether	ug/L	ND 1	ND 1	ND I	ND 1	ND 1	ND 1	ND I	ND I
2-Chlorophenol	ug/L	ND 10	ND 10	ND 10	ND 10	ND IO	ND 10	ND 10	ND 10
1,3-Dichlorobenzene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10

ANALYTICAL RESULTS SUMMARY - PIEZOMETER SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

Time Printed: 2:19 pm

Date Printed: May 12, 1999

Page 1 (b)

AUGUST 1998 - APRIL 1999

Sample Location:		PZ-2	PZ-2 Dup!.	PZ-3	PZ-4	PZ-5	PZ-6	PZ-7	<u>PZ-8</u>
Parameters	<u>Units</u>		•						
TCL Semi-volatiles (Cont'd)									
1,4-Dichtorobenzene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
1,2-Dichlorobenzene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
2-Methylphenal	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
2,2'-Oxybis(1-chloropropane) 4-Methylphenol	ug/L	ND 10 ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 Li	ND 10 ND 10
N-nitroso-di-n-propylamine	ug/L ug/L	ND 10	ND 10 ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10	ND 10	ND 10 ND 10
Hexachioroethane	ug/L ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Nitrobenzene	ue/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Isophorone	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
2-Nitrophenol	l ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
2,4-Dimethylphenol	ug/ L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Bis(2-chloroethoxy)methane	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
2.4-Dichlorophenol	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
1,2,4-Trichlorobenzene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Naphthalene 4-Chloroaniline	ug/L	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10
Hexachlorobutadiene	ug/L ug/L	01 DN	01 DN	ND 10 ND 10	ND 10	ND 10	ND 10	01 DN	ND 10 ND 10
4-Chloro-3-methylphenol	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
2-Methylnaphthalene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Hexachlorocyclopentadiene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
2,4,6-Trichlorophenol	ug/ L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
2,4,5-Trichlorophenol	ug/L	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25
2-Chloromaphthalene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
2-Nitroaniline Dimethyl phthalate	ug/L ug/L	ND 25 ND 10	ND 25 ND 10	ND 25 ND 10	ND 25 ND 10	ND 25 ND 10	ND 25 ND 10	ND 25 ND 10	ND 25 ND 10
Acenaphthylene	ug/L	ND 10 ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10
2,6-Dinitrotoluene	ug/L	ND 10	ND 10	ND IO	ND 10	ND 10	ND 10	ND 10	ND 10
3-Nitroaniline	ug/L	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25
Acenaphthene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
2,4-Dinitrophenol	ug/L	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25
4-Nitrophenol	ug/L	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25
Dibenzofuran	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
2,4-Dinitrotoluene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Diethyl phthalate :Fluorene	ug/L ug/L	2 J	2 J ND 10	ND 10 ND 10	2 J	3 J ND 10	ND 10	ND 10	ND 10
4-Chlorophenyl phenylether	ug/L	ND 10 ND 10	ND 10	ND 10	ND 10 ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10
4-Nitroaniline	ug/L ug/L	ND 10 ND 25	ND 10 ND 25	ND 10 ND 25	ND 10 ND 25	ND 10 ND 25	ND 10 ND 25	ND 10 ND 25	ND 25
4,6-Dinitro-2-methylphenol	ug/L	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25	ND 25
N-nitrosodiphenylamine	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
4-Bromophenyl phenylether	ug/L	, ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10

ANALYTICAL RESULTS SUMMARY - PIEZOMETER SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE

AUGUST 1998 - APRIL 1999

Page 1 (c)

Date Printed: May 12, 1999

Sample Location:		PZ-2	PZ-2 Dupl.	PZ-3	PZ-4	PZ-5	PZ-6	PZ-7	PZ-8
Parameters	<u>Units</u>		Sup						
TCL Semi-volatiles (Cont'd)									
Pentachlorophenol Phenanthrene	ug/L	ND 25 ND 10	ND 25 ND 10	ND 25 ND 10	ND 25 ND 10	ND 25	ND 25	ND 25	ND 25
Anthracene	ug/L ug/L	ND 10	ND 10	ND 10	ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10
Carbazole	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Di-n-butyl phthalate	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Fluoranthene Pyrene	ug/L ug/L	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10	ND 10 ND 10
Butylbenzylphthalate	ug/L	ND 10	ND 10	ND 10	1 J	ND 10	ND 10	2 J	ND 10
Benzo(a)anthracene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
3,3'-Dichlorobenzidine Chrysene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Bis(2-ethylhexyl)phthalate	ug/L ug/L	ND 10 2 J	ND 10 4 J	ND 10 3 J	ND 10 6 J	ND 10 3 J	ND 10 3 J	ND 10 16	ND 10 1 I
Di-n-octyl phthalate	ug/L	ND 10	ND 10	ND 10	ND 10	ND IO	i j	ND 10	ND 10
Benzo(b)fluoranthene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Benzo(k)fluoranthene Benzo(a)pyrene	ug/L	ND 10 ND 10	ND IG ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Indeno(1,2,3-cd)pyrene	ug/L ug/L	ND I	ND 10	ND 10 ND I	ND 10 ND 1	ND 10 ND I	ND 10 ND 1	ND 10 ND 1	ND 10 ND 1
Dibenz(a,h)anthracene	ug/L	ND I	ND 1	ND 1	ND 1	ND I	ND 1	ND 1	ND I
Benzo(g,h,i)perylene	ug/L	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
1,2-Diphenyl-hydrazine	ug/L	ND 1	ND I	ND 1	ND 1	ND I	ND 1	ND I	ND 1
Hexachlorobenzene	ug/L	ND 0.025	ND 0.025	ND 0,025	ND 0.025	ND 0:025 J	ND 0.025	ND 0.025 J	ND 0.025
TAL Metals									
Aluminum	ug/L	450 J	410 J	29000 J	3000 J	1700 J	17000 J	43000 J	110000 J
Aluminum, dissolved Antimony	ug/L	ND 6.5 ND 2.9	ND 6.5	ND 6.5	ND 6.5	48	ND 6.5	ND 6.5	ND 6.5
Antimony, dissolved	ug/L ug/L	ND 2.9 ND 2.9	ND 2.9 ND 2.9	ND 2.9 ND 2.9	ND 2.9 ND 2.9	ND 2.9 ND 2.9	ND 2.9 ND 2.9	ND 2.9 ND 2.9	ND 2.9 ND 2.9
Arsenic	ug/L	3.3	ND 2,4	17	4.4	2.6	37	22	87
Arsenic, dissolved	ug/L	3.9	ND 2.4	2.5	ND 2.4	ND 2.4	7.9	2.7	16
Barium Barium, dissolved	ug/L ug/L	340 J 280	340 J 290	900 J 230	300 J 250	71 J 27	520 J	1400 J	1200 J
Beryllium	ug/L	0.32	0.34	8.7	0.82	0.48	130 4.9	260 16	47 5.5
Beryllium, dissolved	ug/L	ND 0,30	ND 0.30						
Cadmium, dissolved Calcium	ug/L	ND 0.50	ND 0.50	ND 0.50	ND 0.50	ND 0.50	ND 0.50	ND 0.50	ND 0.50
Calcium, dissolved	ug/L ug/L	45000 J 42000 J	42000 J 43000 J	61000 J 60000 J	52000 J 48000 J	56000 J 59000 J	92000 J 77000 J	78000 J 71000 J	50000 J 23000 J
Chromium	ug/L	2.0 J	2.1 3	180 J	46000 J 8.4 J	6.5 J	77000 J 81 J	220 J	23000 J 380 I
Chromium, dissolved	ug/L	ND 0.90	ND 0.90	1.3	ND 0.90	1.6	3.3	1.2	ND 0.90

ANALYTICAL RESULTS SUMMARY - PIEZOMETER SAMPLES PHASE II - RCRA FACILITY INVESTIGATION

OCCIDENTAL CHEMICAL CORPORATION

DELAWARE CITY, DELAWARE AUGUST 1998 - APRIL 1999 Page 1 (d)

Date Printed: May 12, 1999

Sample Location:		PZ-2	PZ-2 Dupl.	PZ-3	PZ-4	PZ-5	PZ-6	PZ-7	PZ-8
<u>Parameters</u>	<u>Units</u>								
TAL Metals (Cont'd)					,				
Cobalt	ug/L	ND 3.6	ND 3.6	31	7.9	ND 3.6	36	120	41
Cobalt, dissolved Copper	ug/L ug/L	ND 3.6 ND 2.2	ND 3.6 ND 2.2	ND 3.6 16	5.5 8.9	ND 3.6 2.6	7.1 37	8.0 ND 2.2	ND 3.6 ND 2.2
Copper, dissolved	ug/L	2.2	ND 2.2	ND 2.2	ND 2.2	2.0 ND 2.2	ND 2.2	ND 2.2 ND 2.2	ND 2.2
Iron	ug/L	17000 J	18000 J	180000 J	78000 J	18000 J	140000 J	430000 J	43000 J
Iron, dissolved	ug/L	15000	16000	77000	55000	12000	29000	59000	72 24 J
Lead Lead, dissolved	ug/L	2.2 J	2.1 J	200 1	20 J	6.3 J	250 J	120 1	24 J
Lead, dissolved Magnesium	ug/L ug/L	1.6 85000 J	1.8 80000 J	5.1 100000 J	3.3 B1000_J	ND 1.0 110000 J	2.0 140000 J	3,6 100000 J	1.1 220000 J
Magnesium, dissolved	ug/L	79000	79000	100000	76000	110000	140000	110000	17000
Manganese	ug/L	4400 J	4200 J	7200 J	4500 J	2900 J	5800 J	8000 J	19000 J
Manganese, dissolved	ug/L	4100	4200	6900	4100	3100	1500	2000	270
Mercury Mercury, dissolved	ug/L	0.45 J	0.29 J	6.6	0,50	0.40	-26	360	30000
Nickel	ug/L ug/L	ND 0.10 ND 3.2	ND 0.10 ND 3.2	ND 0.10 59	ND 0.10 10	ND 0.10 4.6	ND 0.10 58	ND 0.10 110	0,89 56
Nickel, dissolved	ug/L	ND 3.2	ND 3.2	ND 3.2	5.5	ND 3.2	ND 3,2		ND 3.2
Potassium	ug/L	16000 J	14000 J	15000 3	21000 1	19000 1	42000 J	3.7 36000 J	73000 J
Potassium, dissolved	ug/L	16000 J	15000 J	12000 J	21000 J	18000 J	41000 J	35000 J	120000 J
Selenium	ug/L	2,0 K	ND 1.9	4.7 K	3.2 K	3,1 K	5.7 K	12	8.5 K
Selenium, dissolved	ug/L	2.8 K	ND 1.9	4.9 K	2.5 K	ND 1.9	2.3 K	3.1 K	2.8 K
Silver Silver, dissolved	ug/L	1,8 B	1.9 B	2.1 B	1.7 B	1,5 B	2,0 B	2.9 B	2.8 B
Sedium	ug/L ug/L	1.8 B 360000 J	1.5 B 340000 J	2.1 B 420000 J	2.5 B 460000 J	1.4 B 540000 J	1.7 B 560000 J	1.4 B 460000 J	0.91 B
Sodium, dissolved	ug/L	340000	330000	420000	440000	570000 J	530000	490000 J 490000	530000 J 590000
Thallium	ug/L	ND 1.2	ND 1.2	2.2 K	ND 1.2	1.7 K	ND 1.2	5.5 K	ND 1.2
Thallium, dissolved	ug/L	ND 1.2	ND 1.2	1.9 K	1.6 K	ND 1,2	1.2 K	ND 1.2	1.8 K
Vanadium	ug/L	3.2.J	3.0 1	270 J	15 J	8.3 J	180 J	230 J	. 150 J
Vanadium, dissolved Zinc	ug/L ug/L	ND 1.9 24 JK	ND 1.9 17 JK	2.3 990 I	ND 1.9 100 J	2.0 44 J	3,3	ND 1.9	7.1
Zinc, dissolved	ug/L	20 JK	13 JK	24 K	100 J 29 K	44 J 24 K	1300 J 26 K	6000 J 30 K	300 J 14 K
	u _b , D	20 11	15 JK	27 K	47 K	24 K	20 K	30 K	14 N
General Chemistry									
22.14 Charles de 1000 au marie a marie a marie a marie a marie a marie a marie a marie a marie a marie a marie		DOSSONOS - NOS STOREN SANTON ARTON - NOS SANTON ARTON - NOS SANTON ARTON - NOS SANTON ARTON - NOS SANTON ARTON - NOS SANTON ARTON - NOS SANTON - NOS	00000000000000000000000000000000000000	nocification procedure anno accessor men	e enga namanas and militaria and an	n die ennemale enne von von von von	Minimal hadda hadda hadda hadda hadda hadda hadda hadda hadda hadda hadda hadda hadda hadda hadda hadda hadda h		tordelagation at an annual contract of
Chloride Sulfate	mg/L	840	880	980	960	1100	1000	1100	870
Total suspended solids	mg/L mg/L	1.4 3600 J	1.7 700 J	2,2 310	2.2 29000	3.6 4600	12 40000	3.8 1600	48
T T TO THE PERSON OF THE PERSO	ing.	3000 J	100.1	210	29000	4000	49000	1000	810

ANALYTICAL RESULTS SUMMARY - PIEZOMETER SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE AUGUST 1998 - APRIL 1999

Page 2 (a)

Date Printed: May 12, 1999 Time Printed: 2:20 pm

Sample Location:	PZ-9	<u>, </u>
Parameters	Units	
	<u> </u>	
TCL Volatiles		
Chloromethane) 10
Bromomethane Vinyl chloride	ug/L NE ug/L NE) 10) 10
Chloroethane	ug/L NI	110
Methylene chloride Acetone	ug/L NE) 10) 10
Carbon disulfide	ug/L NI	0 10
i,i-Dichloroethene i,i-Dichloroethane) 10) 10
1,2-Dichloroethene (total)	ug/L NI	o 10
2-Butanone (MEK) Chloroform	ug/L NE) 10) 10
1,2-Dichloroethane	ug/L NI) 10
1,1,1-Trichloroethane Carbon tetrachloride	ug/L NC) 10) 10
Bromodichloromethane) 10) 10
1,2-Dichloropropane cis-1,3-Dichloropropene	ug/L NE	0.10
Trichloroethene	ug/L NE) 10) 10
Benzene	ug/L NC) 10
Dibromochloromethane trans-1,3-Dichloropropene	ug/L NE ug/L NE) 10) 10
1,1,2-Trichloroethane	ug/L NE	0 10
Bromoform 4-Methyl-2-pentanone (MIBK)) 10) 10
2-Hexanone	ug/L NE) 10
Tetrachloroethene 1,1,2,2-Tetrachloroethane	ug/L NE ug/L NE) 10) 10
Toluene Chlorobenzene	ug/L ND	0 10
Chlorobenzene Ethylbenzene	ug/L NC ug/L NC) [0]) 10
Stytene	ug/L NE	10
Xylenes (total)	ug/L NC	0 10
TCL Semi-volatiles		
Phenol	ug/L NC) 10
Bis(2-chloroethyl)ether	ug/L N	D I
2-Chlorophenol 1,3-Dichlorobenzene) 10) 10
	45/C 140	• 40

5U:\DBASEGRP\CHEM\7000\7462\Sb) Anal - PZ - Target Analyses

ANALYTICAL RESULTS SUMMARY - PIEZOMETER SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE AUGUST 1998 - APRIL 1999

Page 2 (b)

Date Printed: May 12, 1999 Time Printed: 2:20 pm

Sample Location:	-	PZ-9
Parameters	<u>Units</u>	
TCL Semi-volatiles (Cont'd)		
1.4-Dichlorobenzene	ug/L	ND ID
1,2-Dichlorobenzene 2-Methylphenol	ug/L ug/L	ND 10 ND 10
2,2'-Oxybis(1-chloropropane) 4-Methylphenol	ug/L ug/L	ND 10 ND 10
N-nitroso-di-n-propylamine Hexachloroethane	ue/L	ND 10
Nitrobenzene	ug/L ug/L	ND 10 ND 10
Isophorone 2-Nitrophenol	ug/L ug/L	ND 10 ND 10
2,4-Dimethylphenol Bis(2-chloroethoxy)methane	.ug/L	ND 10
2.4-Dichlorophenol	ug/L ug/L	ND 10 ND 10
1,2,4-Trichlorobenzene Naphthalene	ug/L ug/E	ND 10 ND 10
4-Chloroaniline Hexachlorobutadiene	ug/L ug/L	ND 10 ND 10
4-Chloro-3-methylphenol	ug/L	ND 10
2-Methylnaphthalene Hexachlorocyclopentadiene	ug/L ug/L	ND 10 ND 10
2.4.6-Trichlorophenol 2.4.5-Trichlorophenol	ug/L ug/L	ND 10 ND 25
2-Chloronaphthalene 2-Nitroaniline	ue/L	ND 10
Dimethyl phthalate	ug/L ug/L	ND 25 ND 10
Acenaphthylene 2,6-Dinitrotoluene	ug/L ug/L	ND 10 ND 10
3-Nitroaniline Acenaphthene	ug/L ug/L	ND 25 ND 10
2,4-Dinitrophenol	ug/L	ND 25
4-Nitrophenol Dibenzofuran	ug/L ug/L	ND 25 ND 10
2,4-Dinitrotoluene Diethyl phthalate	ug/L ug/L	ND 10 ND 10
Fluorene 4-Chlorophenyl phenylether	ug/L	ND 10:
4-Nitroaniline	ug/L ug/L	ND 10 ND 25
4,6-Dinitro-2-methylphenol N-nitrosodiphenylamine	ug/L ug/L	ND 25 ND 10
4-Bromophenyl phenylether	ug/L	ND 10

6J:\DBASEGRP\CHEM\7000\7462\5b) Anal - PZ - Target Analyses

ANALYTICAL RESULTS SUMMARY - PIEZOMETER SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE AUGUST 1998 - APRIL 1999

Page 2 (c)

Date Printed: May 12, 1999 Time Printed: 2:20 pm

Sample Location: PZ-9 **Parameters** <u>Units</u> TCL Semi-volatiles (Cont'd) Pentachlorophenol ug/L ND 25 ug/L Phenanthrene ND 10 Anthracene ND 10 ug.L Carbazole ug/L ND 10 Di-n-butyl phthalate ug/L ND 10 Fluoranthene ug/L ND 10 Pyrene ug/L ND 10 Butylbenzylphthalate ug/L ND 10 Benzo(a)anthracene ug/L ND 10 3,3'-Dichlorobenzidine ug/L ND 10 Chrysene ND 10 ug/L Bis(2-ethylhexyl)phthalate ug/L 11 Di-n-octyl phthalate ug/L ND 10 Benzo(b)fluoranthene ug/L ND 10 Benzo(k)fluoranthene ug/L ND 10 Benzo(a)pyrene ug/L ND 10 Indeno(1,2,3-cd)pyrene ND I ug/L Dibenz(a,h)anthracene ug/L ND 1 Benzo(g,h,i)perylene ND 10 ug/L 1,2-Diphenyl-hydrazine ug/L ND 1 ug/L Hexachtorobenzene ND 0.025 TAL Metals Aluminum 7400 J ug/L Aluminum, dissolved ND 6.5 ug/L Antimony ug/L ND 2.9 Antimony, dissolved ND 2.9 ug/L Arsenic ug/L 6.8 Arsenic, dissolved ND 2.4 ug/L Barium ug/L 110 J Barium, dissolved ug/L 23 Beryllium ug/L 1.5 Beryllium, dissolved 0.32 ug/L Cadmium, dissolved ug/L ND 0.50 Calcium 53000 1 ug/L Calcium, dissolved 49000 J ug/L Chromium ug/L 32 1 Chromium, dissolved ug/L 1.1

7U:\DBASEGRP\CHEM\7000\7462\Sb) Anal - PZ - Target Analyses

ANALYTICAL RESULTS SUMMARY - PIEZOMETER SAMPLES PHASE II - RCRA FACILITY INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION DELAWARE CITY, DELAWARE AUGUST 1998 - APRIL 1999

Page 2 (d)

Date Printed: May 12, 1999 Time Printed: 2:20 pm

Sample Location:		PZ-9
Parameters	<u>Units</u>	
TAL Metals (Cont'd)		
Cobalt Cobalt, dissolved Copper Copper, dissolved	ug/L ug/L ug/L ug/L ug/L	6.8 ND 3.6 7.6 ND 2.2
Iron Iron, dissolved Lead Lead, dissolved	ug/L ug/L ug/L	14000 J 1300 18 J ND 1.0
Magnesium Magnesium, dissolved Manganese Manganese Manganese, dissolved	ug/L ug/L ug/L ug/L	110000 J 110000 2600 J
Mercury Mercury, dissolved Nicket Nicket, dissolved	ug/L	2200 4.4 ND 0.10 27 ND 3.2
Potassium Potassium, dissolved Selenium Selenium, dissolved	ug/L ug/L ug/L ug/L	27000 J 24000 J 2.5 K ND 1.9
Silver Silver, dissolved Sodium Sodium, dissolved	ug/L ug/L ug/L ug/L	i.6 B 1.9 B 740000 i
Thallium Thallium, dissolved Vanadium Vanadium, dissolved	ug/L ug/L ug/L ug/L	720000 I.5 K I.4 K .49 J
Zinc Zinc, dissolved	ug/L ug/L ug/L	3.9 170 J 14 K
General Chemistry		
Chtoride Sulfate Total suspended solids	mg/L mg/L mg/L	1400 3.4 890

Notes

NDx

- Not detected at or above x.

Estimated.

Dupl.

- Field duplicate.

K

- Value is estimated indicating a potential high bias.

В

- Analyte was present in an associated blank, indicating probable contamination.